ASPECTS OF PREVENTIVE CARDIOLOGY *

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I—THE ELABORATION OF PUBLIC HEALTH

THERE has been argument on the propriety of bringing the non-infectious illnesses within the ambit of epidemiology; yet the definition adopted long ago by the Sydenham Society—" epidemiology treats of diseases prevalent among a people at a special time "—supports a wide view. Of course, too, the word epidemic is commonly used in a non-medical sense: epidemic terror of an imaginary danger (Scott), an epidemic of despair (Burke), epidemics of opinion (Brodie), the toleration of epidemic whoredom (Milton). There is really nothing new in giving (as I do) a very broad interpretation to the word.

It is now common practice to relate epidemiology to the biologist's ecology. Applied to diseases, both terms—epidemiology and ecology—properly connote a wide conception of ætiology: all the factors, direct and indirect, near and remote, involved in causing disease, are taken into account.

Since the days of Gavin Milroy, the outlook and content of that branch of medical practice we call public health has radically changed. Today public health gives thought not only to those illnesses spread by grossly insanitary conditions, or due to micro-organisms, but to illness in general. Nor should it be altogether surprising that public health is taking a wider and clinical outlook. That outstanding pioneer, Johann Peter Frank (1745–1821), who two hundred years ago wrote the *System of Medical Policy*—the veritable foundation-stone of modern public health—was himself an able clinician, and for some years a professor in clinical medicine in Vienna. Pioneer of organised health arrangements, Frank was not concerned with environmental hygiene alone, but held that the principles of physiological living, including dietetics and personal hygiene, should be promulgated by the State as an educative function.

For effective health work, sound vital statistics are essential. Well-based morbidity statistics are not easy to get. As the years go by, the National Health Service will provide much valuable statistical information on illness in Britain, but for most countries at present sound statistics on morbidity can be collected only with great difficulty.

Mortality data come more readily to hand. Although it has been fondly " hoped that someday there will be morbidity records of such precision that death certificates can be consigned to the rubbish heap of outworn instruments ", yet—imperfect though they are—mortality statistics are likely long to remain the more useful tool (Stocks 1950).

Comparison of figures over the years in one's own country is usually enlightening, but comparing the statistics of several countries may be a hazardous process. Fashions in medicine vary from country to country as they do from year to year, and the standards of medical training and practice vary too. From even a cursory study of international statistics we see the need for extreme wariness in their handling.

In 1956 there were in Australia 86,088 deaths, just under 900 per 100,000 population. Fig. 1 shows that

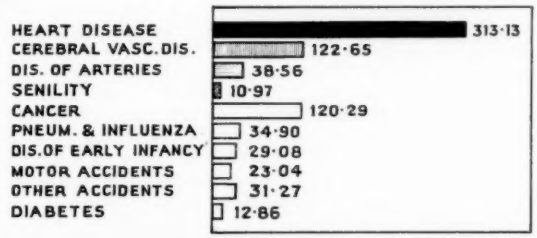

Fig. 1—For every 100,000 people in Australia there now are, in round figures, 900 deaths each year: about half (437) are due to cardiovascular diseases; 120 to cancer; 25 to road accidents; 10 to tuberculosis, and 0·1 or less to diphtheria.

more than half the deaths were put down to cardiovascular diseases. In several other countries a similar circumstance is noted: figures for Britain, U.S.A., New Zealand, and Australia are shown in table I. The proportion of deaths from diseases of the circulatory system (code items 400 to 468 in the *International List*—1948 Revision) has been steadily mounting in the past half-century, and comparison of the years 1907 and 1956 provides striking contrast (fig. 2). It is common statistical practice to combine the cardiovascular-renal and senility figures, making a broad group and so reducing the likelihood of wrong inferences from comparisons.

About half the deaths occurring fifty years ago were of people under 40 years of age; now only one-eighth come

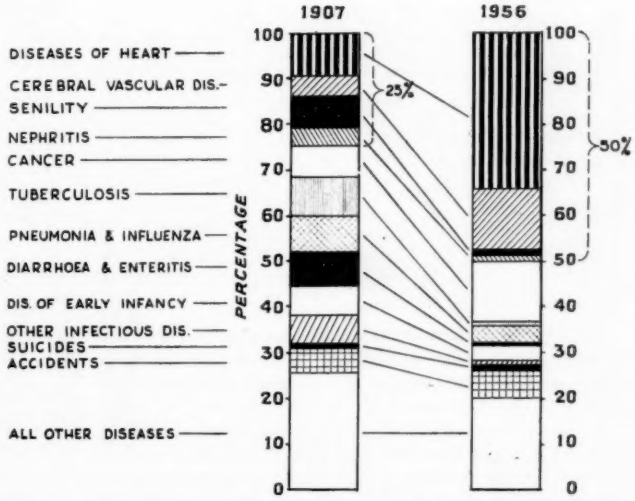

Fig. 2—In 1907 cardiovascular diseases, with nephritis and senility, were blamed for 25% of all deaths; fifty years later those combined causes accounted for 50% of deaths.

* From the Milroy lectures for 1959, delivered before the Royal College of Physicians of London on Feb. 3 and 5.

TABLE I—PROPORTIONS OF CERTAIN DEATHS IN CERTAIN COUNTRIES, 1953–55

—	Australia	New Zealand	England and Wales	U.S.A.
Cardiac (B24–28)* ..	33·5	34·6	33·8	37·9
Vascular (B22)	13·4	12·3	14·1	11·3
Renal (B38)	1·8	1·0	1·0	1·3
Total cardiovascular-renal	48·7	47·9	48·9	50·5
Malignant neoplasms (B18)	14·3	16·0	17·7	15·6
All other	37·0	36·1	33·4	33·9
Total	100·0	100·0	100·0	100·0

* The groups shown are from the *Abbreviated List* (based on Sixth Revision of the *International List*).
B22: Vascular lesions affecting the central nervous system.
B24: Rheumatic fever.
B25: Chronic rheumatic heart-disease.
B26: Arteriosclerotic and degenerative heart-disease.
B27: Other diseases of heart.
B28: Hypertension with heart-disease.
B38: Nephritis and nephrosis.

in that group (fig. 3). People over 60 now contribute two-thirds of the deaths, compared with one-quarter early in the century.

Contrasting with the decline in deaths from diseases of the circulatory system in young adults is the increase in those diseases in older people (fig. 4). Briefly stated, with the increasing proportion of old people in our communities, we are required to give more attention to geriatrics. The altered age-structure of our populations accounts for much of the increase we have observed in deaths from diseases of the heart and blood-vessels (fig. 5).

The allotment of deaths from diseases of the circulatory system in the statistical subgroupings shows the general similarity of British and Australian figures (fig. 6). The apparent discrepancy in the groups " arteriosclerotic

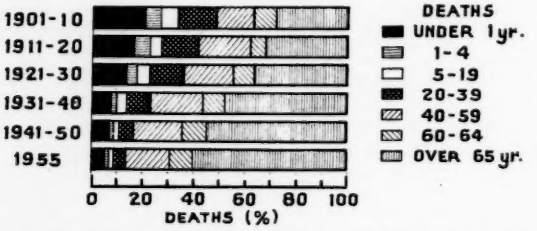

Fig. 3—Study of the altered age-incidence of deaths in the past half-century is illuminating. Infantile deaths, from being over 20% of all deaths, are now less than 5%. For people under 40 years the percentage changed from 50 to 12; for those over 50 years from 30 to over 60.

heart disease " and " other myocardial degeneration " suggests that Australian doctors are somewhat more ready to blame the coronary vessels than are their colleagues in Britain.

Fig. 7 illustrates for Australia the rapid increase in the proportion of deaths from circulatory diseases (and from the cancers) and the decline in deaths attributed to tuberculosis and to senility.

Varieties of Heart-disease

Prevention can be considered in a rational way only after dissecting the subject and studying the component parts.

First we may note that cardiophobia is rampant today, and cardiologists spend much time convincing anxious people of their circulatory soundness. A large proportion of those who come to the physician fearing they have heart-disease are found to have other causes for their troubles.

Then there is " athlete's heart ". Some people have the idea that exertion can damage the heart, but cardiologists agree that even vigorous exertion does not injure a sound heart. Indeed, it has been claimed that an athlete who continues to take exercise beyond his very active years is unlikely to become a victim to coronary-artery disease. Harm may come when sufferers from toxic states or infections take violent exercise, as when a schoolboy developing rheumatic fever goes on the football field rather than " let the team down ".

Variants in cardiac rhythm and sounds, within the

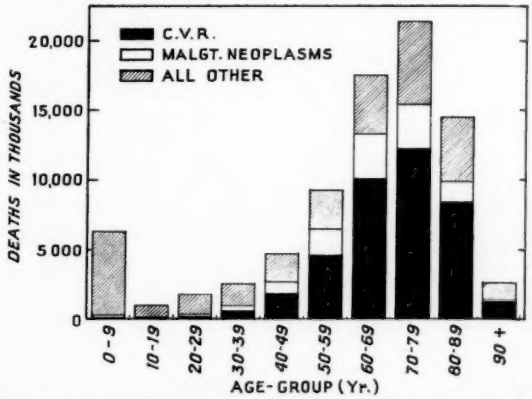

Fig. 4—The cardiovascular-renal diseases accounted for relatively few deaths in people under 40 years of age. In older age-groups the incidence of deaths from those diseases increased; 50% of all deaths of persons over 60 years of age were attributed to C.V.R. diseases.

range of the normal, call for the physician's thoughtful decision. The days when children with sinus arrhythmia were put to bed have fortunately passed. Yet to assess the importance of unusual cardiac signs is often difficult; when there is no circulatory embarrassment they can generally be dismissed as negligible. The doctor takes a heavy responsibility when he tells a patient he has heart-disease.

The condition of D.A.H. (disordered action of the heart), effort syndrome, or neurocirculatory asthenia worried Army doctors in the first world war. Probably the general recognition of its functional nature led to its decline. In the second world war effort syndrome was almost a rarity. The nervous dysfunction at that time commonly found somatic expression as a digestive disturbance: peptic ulcer was the popular diagnostic label. In both conditions—functional disease of heart and of stomach—the concern shown by the Servicemen's doctors was a strong factor, causing or at least aggravating the trouble.

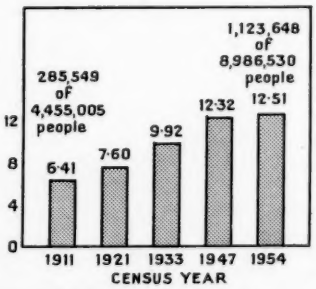

Fig. 5—The increasing proportion of elderly people in the community, as shown for Australia, is a common circumstance in many countries. Of a population of 9 million, those aged over sixty years number 1¼ million (12·5%). It is reasonable to expect a corresponding increase in diseases of the elderly; hence the modern rise of geriatrics.

It comes as a surprise at first to learn

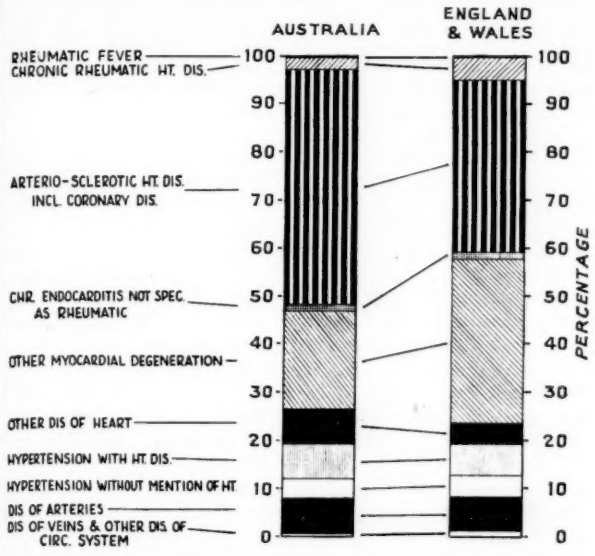

Fig. 6—Comparison of the types of circulatory deaths occurring in Australia with those in Britain. The differences are insignificant; they probably are to be attributed to the use of different terminology.

that the statistician's "functional heart-disease" excludes conditions specified as psychogenic. Surprisingly, too, it includes fibrillation (auricular or ventricular) heart-block, pulsus alternans, and paroxysmal tachycardia; cases of those are classified in code item 433 of the *International List of Causes of Deaths* (1948 Revision), unless the certificate indicates the presence of coronary-artery disease or some other organic change as the cause of the disorder. Functional heart-disease receives no further consideration here.

From their low incidence, or from their having no known cause, or from their being quite unpreventable, many organic cardiovascular diseases important to the clinician cannot usefully be discussed here. Yet some of those groups merit brief mention:

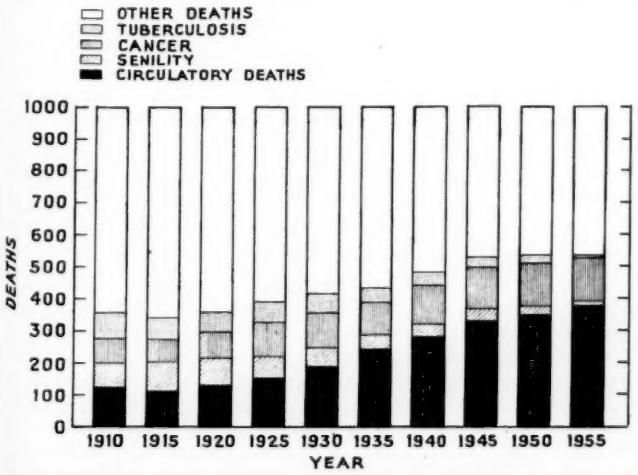

Fig. 7—During the first half of this century there has been a steady increase in deaths from diseases of the circulatory system (code items 400-468). "Senility" now figures far less frequently as a cause of death than it did in the early part of the century.

Bacterial Endocarditis

Here Farr's dictum, that diseases are more easily prevented than cured, applies in force. What a transformation has been wrought, both in prophylaxis and in treatment, by penicillin! Early and vigorous treatment is wise and often effective, but prophylaxis is better, for many patients—though saved in the primary illness—die from congestive heart-failure or some other sequela.

Myocarditis

Apart from reference to a few toxic states, and some rare diseases such as endomyocardial fibrosis, we hear little mention of myocarditis now. The term "chronic myocarditis" was formerly applied to degenerative conditions of the myocardium; that incorrect usage has been discarded.

Cardiovascular Syphilis

With the more effective control of syphilis now practicable, the incidence of its visceral lesions has declined. The statistician classifies cardiovascular syphilis not with diseases of the circulatory system (400 to 468 on the "long" list) but in the group "syphilis and its sequelæ" (022 and 023).

Cor Pulmonale

When chronic bronchitis, tuberculosis, or pneumoconiosis is the cause, this condition has public-health importance. Prevention of cor pulmonale is practicable in so far as its cause may be preventable.

Hormonal Disorders

Cardiac disorders from thyrotoxicosis, myxœdema, or the Cushing syndrome are of more concern to the clinician than to the public-health officer. Disorders accompanying the menopause are common. In diabetes, coma deaths today are rare, compared to the frequency of cardiovascular fatalities in diabetic subjects.

Peripheral Vascular Diseases

From their increasing incidence, peripheral vascular diseases are becoming significant in public health. The general problem of arteriosclerosis is discussed later.

For the statistician and the public-health man, the major groups of heart-disease are but three—rheumatic, arteriosclerotic, and hypertensive.

The published figures from various places accord with my own Australian experience in hospital work and consulting practice that the incidence of heart-disease from rheumatism and from syphilis has markedly declined, while that of the arteriosclerotic and hypertensive groups has greatly increased. In some places there may have been an increase in congenital cases: in recent years, at least, they have had more attention paid them.

Congenital Defects of the Heart

Although Osler (1913) and Lewis (1942) gave no encouragement for hope from treatment of congenital defects of the heart, and certainly none on the prospect of preventing them, work of recent years has brought a brighter view. First came the discovery of the association of rubella with the occurrence of congenital defects. More recently we welcomed the experiments of Ingalls, and the increasing ability of surgeons to reduce and even remove the ill effects of some congenital lesions.

The types of defect we are especially concerned with are those developing in the early weeks of intrauterine life. It is a biological principle that the individual—in his ontogenic development—climbs, as it were, up his

phylogenetic tree. The occurrence of the congenital anomaly shows that the climbing stopped too soon. Animal experiments have shown that subjection to the effects of radioactive rays, or to certain types of vitamin-deficient diets, may cause mothers to produce malformed progeny.

The report by Gregg of Sydney (1941) on the association of German measles and congenital anomalies led to studies in other Australian centres and other countries. It is accepted that when a pregnant woman contracts rubella in her first trimester some kind of congenital defect is likely to appear in her child. It has been thought wise to give injections of gammaglobulin to pregnant women who, not having had rubella, come into contact with a case during their early months of pregnancy. It is also a good thing if girls have rubella before they marry. Australian workers and others have exonerated morbilli and other common infections; toxoplasmosis has been blamed in some countries, but rubella is the outstanding culprit almost everywhere.

The point is that congenital defects are not all genetically determined at the moment of conception; they can be acquired during the course of fœtal development, as the experimental work of Ingalls with pregnant mice has shown. Anoxia is a damaging agent to the fœtus, and by varying the degree of anoxia, the time of exposure to its influence, and the stage of pregnancy for the experiment, the precise nature of the defect produced can be determined (Ingalls 1956). One application of the work is that women in early pregnancy may be wise to avoid aeroplane flights, certainly at high altitudes in non-pressurised machines. Surgical operations and major dental procedures are also best avoided during pregnancy. Ingalls optimistically expects that congenital anomalies will eventually be brought under control. A new vista is opening into darkly clouded country.

Acute Rheumatic Infection

Pitcairn in 1788 is given credit for being the first to report the connection of heart-disease with acute rheumatism. Edward Jenner in 1789 presented a paper on a Disease of the Heart following Acute Rheumatism (Baron 1838). Neither report was published (Willius and Dry 1948). Jenner's " lost manuscript " was prepared for the Gloucestershire Medical Society (Jenner's " Medico-Convivial Society "); Jenner became so insistent about rheumatic fever being a basis of heart-disease that he was in danger of being expelled from the society as a bore (Carter 1896, LeFanu 1951).

A hundred years later Newsholme (1895) in his Milroy lectures discussed the epidemiology of rheumatic fever, especially the influence of rainfall and ground water; " it is essentially a soil disease. . . . The search for a microbic cause is proceeding but the evidence is incomplete and unsatisfactory; there appears little scope for preventive measures". The soil—what blame it had to take!—yet today we go to it for the antibiotics we use to cure infections.

Really the first significant advance from the time of Sydenham—apart from the observations of Pitcairn and Jenner—was the report by Mantle of Durham (1885) that he found rheumatic fever to be an occasional sequel of acute tonsillitis. The growth of bacteriology stimulated studies of febrile illnesses; but the question of the cause of rheumatic fever remained unsettled till Coburn, Todd, and others gave it some stability. Now we convict the *Streptococcus pyogenes* of Lancefield group A, but just how it does its nefarious work is still not clear. It is commonly thought that, in some way, individual predisposition is significant.

Coburn's work (1931) clarified many points; his delineation of the three clinical phases—primary throat infection, silent period, and joint (and cardiac) involvement—helped to impress the importance of prompt and firm treatment of the infection. Valuable contributions were made by many British workers, including Glover, Schlesinger, Parkinson, and Long. Todd's noteworthy work on anti-streptolysin titres confirmed Coburn's ideas (Todd et al. 1939). Clinicians now regard every case of rheumatic fever as a cardiac case, or at least a potential one: " Rheumatic Fever is Heart Fever " is a slogan of the American Heart Association. Rheumatic heart-disease is certainly a public-health problem.

Most cardiac deaths in people under 40 years of age result from rheumatic infection; recognition of that fact has stimulated research on rheumatic fever, what it is, and how to deal with it. Prospective studies such as those by Holmes and Williams (1958), observing infections of the throat and their results in a large group of children living in an institution, promise helpful results.

Prevention has three facets: (1) prevention of streptococcal infections, (2) prevention of rheumatic fever, and (3) prevention of rheumatic heart-disease.

Control of streptococcal infections is no easy matter. Often the best that can be done is to minimise their damage by prompt and vigorous treatment, and fortunately penicillin still retains its power. If a severe florid infection of the throat appears clinically to be streptococcal, the wise doctor will treat the patient quickly and adequately with penicillin without waiting for any special laboratory investigation. Simple measures—rest in bed and aspirin—may suffice for mild cases.

Preventing the development of rheumatic fever depends on the prompt and effective control of the primary infection in the throat. In that way first attacks of rheumatic fever may be averted. Much attention in the last few years has been devoted to preventing the recurrent attacks; they constitute the main hazard for the heart and they are generally amenable to preventive measures. At first the sulphonamides were used, continuing with a dose of about one gramme each day for months or even years. Later it was found that penicillin, especially in the form suitably given by mouth, is a convenient and effective agent; sulphonamides are not now recommended for the purpose. Programmes have been drawn up by several authoritative bodies (Royal College of Physicians 1957, World Health Organisation 1957b, American Heart Association). The basic idea is that the prophylactic agent should be given in adequate amount for five years or until the patient reaches the age of 18, whichever period is the longer. The scheme has been found practicable and helpful.

The long-term administration of antibiotics, even of the relatively safe penicillin, has obvious disadvantages. Although so far it appears that the streptococcus has not retaliated by building up resistant strains, it seems possible that resistant staphylococci—today the graver hazard—may be developed. Perhaps, too, there are other disadvantages, less apparent yet. The psychiatrist, for instance, may claim that this long-continued supervision of well people conduces to hypochondriasis. We may hope that some simpler and less hazardous way of preventing recurrences may some day be evolved. All will agree on two measures: treat the primary streptococcal infection

TABLE II—THE MORTALITY OF YOUNG ADULTS (AGED 15 TO 24) IN AUSTRALIA

Deaths per million per annum (Lancaster 1957)

Period	All causes		Diseases of circulatory system		Violent and accidental causes	
	Males	Females	Males	Females	Males	Females
1908–10	3036	2934	235	247	809	199
1911–20	3128	2761	224	244	793	174
1921–30	2468	2176	145	146	844	165
1931–40	2099	1642	114	121	937	177
1941–50	1489	1036	90	84	768	144
1951–55	1746	659	33	27	1227	166

vigorously with penicillin, and devote full care to convalescence.

The idea that cortisone would help to prevent cardiac damage in rheumatic-fever patients called for study; the joint trial by scientific workers of the Medical Research Council and the American Heart Association was a triumph of international organisation. Although hormone therapy sometimes gave advantages in the early stages of treatment, assessment of the results at the end of a year left nothing to choose between cortisone and aspirin (Medical Research Council 1955). More recent work may modify that view (Schlesinger 1955, Illingworth 1958).

The amount and severity of acute rheumatic infection in many communities appear to be steadily decreasing. Wilfrid Sheldon (1958) has reported that in 1907–09 the average annual admissions to Great Ormond Street Hospital for rheumatic fever, carditis, and chorea were 216; in 1955–56 there were 25 only. For Australia, the statistics of Lancaster (1957) in table II are relevant. Mortality figures for Australia and Britain are indicated in fig. 8. Many countries show a striking decline in the incidence of primary cases of rheumatic fever and of deaths from it, but few places can produce precise morbidity statistics. Notification of rheumatic fever has come into vogue only in recent years. In the clear-cut form of forty years or more ago the disease is now less often seen, and the mild atypical cases are less surely diagnosable. Further, rules for reporting are incompletely observed, especially for the first few years after their introduction. In all States of the Australian mainland rheumatic fever is notifiable: the annual reported incidence in the last three years has averaged only 5 cases per 100,000 people.

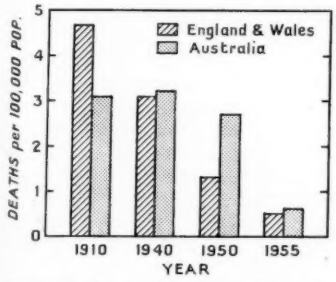

Fig. 8—Decline in deaths from rheumatic fever in England and Wales and in Australia. Deaths due directly to rheumatic fever are not common; continued decline in deaths from rheumatic heart-disease may be expected.

In the general decline of rheumatic fever, improved social conditions have probably helped materially (Medical Research Council 1927, Sangster 1940). With the aid of penicillin, the prospects for continued success are encouraging. We may confidently expect that, at least for many years, rheumatic heart-disease will remain preventable and will not again become a public-health problem of grave magnitude. And mitral-valve surgery promises much for some of the cases that " slip through ".

High Blood-pressure

Modern man (or especially modern woman) views no bodily disorder with greater alarm than one involving a raising of the blood-pressure. Often the individual's fear is groundless, but in the mass of the people there is enough evidence of organic damage to give us concern. Troubles arising from hypertension constitute a large and growing group of cardiovascular disorders. In most cases the disorder is suitably classed as essential or primary hypertension, the diagnosis being made most often by failure to find in those patients any underlying cause for the hypertension. In a small number of high-pressure subjects (about 10%) some underlying cause can be found, the raising of arterial pressure being then secondary to some renal, endocrine, or other disorder; many such cases have been reported (e.g., Miller and Garvan 1957).

The search for the basic cause or causes of primary hypertension still goes on. Pickering (1955) has reviewed at length the current views, and his book is likely long to remain the vade-mecum on the subject. He finds no sound reason for regarding essential hypertension as a definite disease; it represents rather an arbitrary upper section of a normal range of pressure—a graded characteristic. Men's blood-pressures vary (says Pickering) and their body heights vary; the tall men are not regarded as exhibiting a pathological state, and perhaps men with raised blood-pressure should not be so classed, at least from that fact alone. Few will agree that the matter is quite as simple as that, though there is much unnecessary anxiety about raised blood-pressure. Indeed, it has been cynically said that the greatest risk in having high pressure is that some physician may find out about it, and want to treat it—worse still, may it be said, some surgeon.

The effects of raised blood-pressure are variable. In some subjects a sudden change may occur with a passing of the clinical features from simple to malignant; that severe phase, once regarded as a separate disease, is now classed as an advanced stage of essential hypertension. Severe necrotic changes and endarteritis of the renal arterioles were first noted by Fahr; he called it malignant sclerosis. The characteristic retinal changes were later described as associated with the state of acutely progressive renal insufficiency. The cause of the malignant change is still undetermined (Byrom 1954, Smith et al. 1958).

Most people with raised pressure appear perfectly well and remain so for years and years. For those symptom-free people, especially if the elevation is intermittent and not gross, it is almost impertinent to suggest treatment, yet some moderation of their activities is often indicated. Years ago Osler said:

" There is nothing more difficult than permanently to reduce a persistently high blood pressure. Drugs have very little influence . . . more important results may follow change in men's habits. I give two prescriptions: Go slowly; eat less. I find a great many patients put about the same value on that as did Naaman on the prescription of Elisha."

But there has been progress in treatment since Osler's day; careful medical management gives relief, and perhaps prolongs life for those with high pressure and some disturbing symptoms.

Although research has continued unabated all over the world for nearly half a century, the actual pathogenesis of essential hypertension is still unknown. It is probably multifactorial (Pickering 1955); life stress (Wolf et al.

1955) disturbed electrolytes, endocrine disorder, renal changes, body-type, ageing, obesity—all those and more have come under suspicion. Racial differences may be significant: for instance, Australian aborigines and the natives of New Guinea seem relatively insusceptible (Casley-Smith 1958). Heredity has been thought to be a significant factor; many workers, including in recent years Platt (1947) and Pickering (1955), have studied that aspect. Another claim recently revived has been that a high intake of sodium chloride is one of the fundamental causes; as long ago as 1920 F. M. Allen put forward that idea, and advised a low-salt dietary. Knowledge on the whole subject is incomplete and " foggy "; until clarification is achieved, little more than symptomatic treatment can be advised, and even that should not be too vigorously applied. Perhaps health education can assist in prevention, but so far the most we can say (much as Osler did) is " Live sensibly, calmly, simply".

A writer in *The Lancet* has said:

" At present blood-pressure can only be lowered at the cost, not only of constant medical supervision, but also of various unpleasant effects. Before he exposes symptomless hypertensives to the perils of mecamylamine ileus, veratrine emesis, reserpine psychosis, or hydrallazine lupus, a manometric Procrustes should be sure of his ground."

It will be recalled that Procrustes the Stretcher, in the fable of Ancient Greece, used an iron bedstead on which to tie all travellers who fell into his hands. If they were shorter than the bed, he stretched their limbs to make them fit it; if they were longer, he lopped off a portion. The steady advance towards stereotyped mediocrity in numerous departments of life is one of the grave detractions of modern times: Procrustes in various ways has been busy among us.

Arteriosclerosis

Medical terminology abounds with inexactitudes and difficulties. A word, especially a newly coined word, may come to be used with such a variety of meanings that we are soon driven to define it whenever we use it. Arteriosclerosis, introduced by Lobstein in 1833, is such a word. Now we recognise several kinds of " hardening of the arteries ", and several names have come into general use, with consequent confusion.

" Arteriosclerosis " may suitably be retained as a wide term, embracing several kinds of arterial disorder. This classification accords with clinical experience:

(1) *Mönckeberg's sclerosis*, characterised by " pipe-stem " arteries. It is degeneration of the middle coat, generally of medium-sized arteries, and calcification is common. The radio-opaque vessels, often prominent in X-ray films of old people's limbs, come in this category.

2. *Diffuse arteriolar sclerosis*, from hypertrophy of the muscular coat. That is the change associated with persistent hypertension; it commonly affects the precapillary arterioles such as those in the kidneys and other viscera.

3. *Atheroma or atherosclerosis*—Marchand gave it the name in 1904—appears first as a thickening of the intimal coat, especially of the aorta and of the coronary and cerebral arteries. Lipid deposition, fibrosis, and calcification come later. The cause has been keenly, almost violently discussed over the last few years, and the argument still goes on.

A fourth condition has sometimes been included:

4. A degenerative change in the elastic tissue of arteries, exemplified by the corkscrew temporal arteries in people past middle life. It is neither Mönckeberg sclerosis nor atherosclerosis, but rather a weakening of the elastic fibres of the vessel wall (Kellner 1956). It seems preferable to class this condition not as arteriosclerosis, but rather as an elastosis (Lansing 1956).

The condition mainly responsible for the high death-rates from cardiovascular disorders, so strikingly shown in the statistics of most countries in recent years, is atherosclerosis—the modern epidemic (Morris 1957). At the present time no disease, unless it be the cancers, is being investigated more assiduously.

(To be concluded)

NEEDLE IMPLANTATION OF YTTRIUM SEEDS FOR PITUITARY ABLATION IN CASES OF SECONDARY CARCINOMA

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IT is now well established that a proportion of breast and prostatic carcinomas are " hormone-dependent ", and so can be made to regress by certain endocrine ablations or hormonal administrations. Various forms of endocrine treatment can be very useful when other more radical methods are no longer applicable. But only by therapeutic trial can one discover which cases are hormone-dependent. Further, since endocrine treatments are never completely curative, the methods used for ablation should be simple enough not to involve undue risk to sick patients. They must also be complete enough to be functionally effective. For pituitary ablation, which is one of the most effective of these procedures, the insertion of radioactive seeds by a needle (first described by Forrest and Peebles Brown 1955) seems eminently suited to these patients. On the other hand, it has not always achieved adequate functional ablation with sufficiently few complications.

In this paper we report our preliminary experiences with such an implantation method. It has proved effective, and a study of the results indicates how complications may be avoided.

Methods

Radiation Plan

Our object was to deliver a necrotising dose of radiation to most of the anterior pituitary.

The gland is known to have a fairly high resistance to radiation and requires a high dose for its ablation. For example, Kelly et al. (1958) found that the minimum dose of beta radiation which will cause necrosis of the pituitary in monkeys is between 110,000 and 190,000 rep. Young (1957) studied the pituitary glands of patients who had been treated by radioactive gold-grain implants and concluded that a dose of about 70,000r of gamma radiation appeared necessary to cause necrosis in most parts of the gland, while cells adjacent to the capsule seemed to be even more resistant.

A dose of not less than 100,000 rads was thought appropriate.

Radioactive yttrium (^{90}Y), first suggested by Rasmussen et al. (1953), was chosen as the source of radiation because it emits a high-energy beta radiation only (2·3 MeV), and

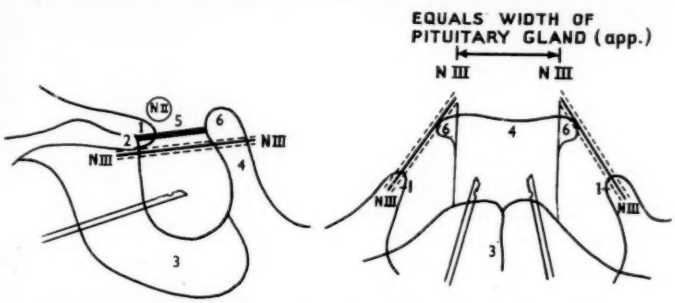


Fig. 1—Diagram of pituitary fossa in lateral and 25° tilt occipito-frontal projections. The needle for insertion of ^{90}Y seeds is shown in situ. The position of the diaphragma sellæ and third nerve is shown. The optic chiasma may lie in contact with any part of the diaphragma sellæ. The width of the pituitary gland approximates that of the " waist " of the dorsum sellæ.

1. Anterior clinoid process.
2. Tuberculum sellæ.
3. Sphenoid sinus.
4. Dorsum sellæ.
5. Diaphragma sellæ.
6. Posterior clinoid process.

N II. Optic chiasma.
N III. Oculomotor nerve.

therefore a necrotising local dose may be given without damaging the structures outside the fossa. To permit flexibility in the distribution of the dose according to the shape of the gland, we thought it would be best to distribute a number of small sources, or seeds, of radioactive yttrium throughout the anterior lobe. The physical properties of the seeds used (measuring 3 × 1 mm., and having an activity of about 1·5 mC) have been described by Mallard et al. (1956). Assuming that 100,000 rads is required to produce pituitary necrosis, the necrotic radius of these seeds would be about 3 mm.

Anatomy of Pituitary Fossa: Danger Areas

Bloch and Joplin (1959) have recently found that important information may be obtained from skull films taken in two standard views—a localised view of the fossa taken in the lateral and a 25° fronto-occipital projection (at focus-film distance of 28 in.). These define three important landmarks (fig. 1):

(*a*) On the lateral view, the position of the diaphragma sellæ. This extends from the tuberculum sellæ to the most anterior point of the anterior convexity of the posterior clinoids. The optic chiasma may lie in direct contact with the diaphragma at any point on its upper surface (Schaeffer 1924).

(*b*) On the 25° fronto-occipital view, the width of the gland equals the width of the narrowest part of the " waist " of the dorsum sellæ, just below the posterior clinoids.

(*c*) On this same view the third nerve runs along a line joining the lateral convexity of the posterior clinoid to the apex or upper convexity of the anterior clinoid, and thus lies well lateral to the gland.

From this we may conclude that no yttrium seeds should be placed within 3 mm. (the necrotic radius of the seeds) below the diaphragma and 3 mm. inside the lateral margins of the gland. A pattern of implantation can be planned which, while avoiding these areas, delivers 100,000 rads or more to the anterior lobe. Our early results suggest that the complications of this implantation procedure are due to seeds being placed in these danger areas.

Implantation Technique

Implantation is done under X-ray guidance with the aid of two image intensifiers, by passing up each nostril a specially designed introducer needle whose side-hole permits lateral implantation of seeds. By rotating the needle, a cone of radially arranged seeds can be inserted (see appendix for description of the needle and X-ray apparatus used).

From the preliminary skull films—allowance being made for the magnification—tracings are made to show on the lateral view the diaphragma sellæ and the 3 mm. danger area below it. As the anteroposterior projection used for implantation does not display the " waist " of the dorsum sellæ, the width of the gland is converted for convenience into " needlebreadths " from the midline, for, when viewed on the intensifier screen, the needle and the pituitary area will be magnified to the same degree.

The patient lies supine on the screening couch, with the head supported on a wedged polyethylene pad and the chin slightly flexed. As soon as she is anæsthetised, the position of her head is maintained with a clamp, and both the horizontal and the vertical X-ray beams are centred over the pituitary fossa (fig. 2).

The procedure is observed by the radiologist, who gives instructions to the operator. The tip of the nose is elevated to its maximum, and the needle is passed through the nostril as closely parallel to the orbitomeatal baseline as possible. When the floor of the sphenoidal sinus is reached, the position of the needle relative to the midline is checked on the vertical image intensifier. The needle is aimed to lie 1–2 needle-breadths (1·8–3·6 mm.) inside the lateral margin of the gland. When a satisfactory position has been obtained in the postero-anterior view, the needle is advanced under the guidance of the lateral image intensifier to the base of the pituitary fossa. It is tapped through the fossa floor low down, at about a third of the fossa depth above the floor, and advanced until its lateral opening is just inside the fossa. Radiographs are then taken to confirm the position of the needle before any seeds are inserted.

If the needle is in a good position, the seeds need be implanted only towards the midline—i.e., from the right side they are placed at 2, 3, and 4 o'clock, and from the left side at 8, 9, and 10 o'clock. In practice, it is best to insert the first seed in the mid position at 3 or 9 o'clock, and then to arrange the others above and below. If the first seed lies too high, all the later seeds must be implanted downwards. When the implant is completed on one side the same procedure is carried

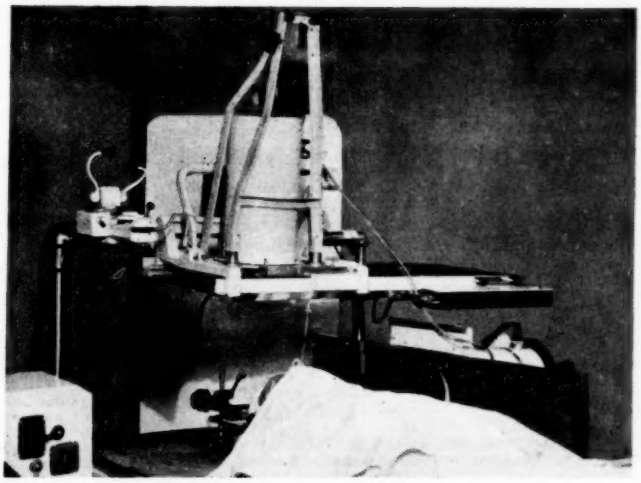


Fig. 2—The horizontal and vertical image intensifiers are in position, and the implant needle has been inserted in one nostril.

TABLE I—RESULTS[a] OF PITUITARY IMPLANTATION IN CANCER PATIENTS

Group of patients (number)	Hypopituitarism (shown by tests)	Complications					Improvement in cancer (female breast only)	
		Meningitis	Rhinorrhœa (permanent)	Ocular		Any	Objective and subjective	Subjective
				Field defect	Paresis			
Pre-1958 group (18) ..	12/15 (*80%*)	4/18	4/18	5/18	5/18	13/18[b] (*72%*)	7/11 (*63%*)	7/13
1958 group (18) ..	10/12 (*83%*)	2/12	2/12	0/12[d]	1/12[d]	4/12[c] (*33%*)	4/6 (*66%*)	5/8

a. All figures are quoted as a proportion of the patients fully assessed in each respect.
b. Including 2 transient cases of rhinorrhœa.
c. „ 1 „ case „ „
d. Excluding 1 case with these as sequel to meningitis.

out through the opposite nostril. If the needle lies rather too high in the fossa, provided it is not above the safety margin recommended, all the seeds are implanted in a downward direction. If the needle is too close to the midline it may be possible to implant the seeds to both sides and achieve a satisfactory distribution. To seal the exit, after all the seeds have been inserted and before the needle is withdrawn, 0·5 ml. of 6% sodium alginate and then 0·5 ml. of 6% calcium chloride are injected.

The Patients Treated (table I)

Of the 31 patients with widespread secondary carcinoma, 28 were women with breast carcinoma and 3 were men (2 with prostatic, and 1 with breast primaries). In all cases the disease was no longer controllable by radio-

TABLE II—RHINORRHŒA OR MENINGITIS IN RELATION TO THE POSITION OF SEEDS

—	Total cases	Seed—diaphragma distance[a]		
		0–1 mm.	1·1–2·5 mm.	2·6 or greater
With rhinorrhœa and/or meningitis	11	5[b]	6[c]	0
Without rhinorrhœa or meningitis	16	6	5	5

a. Distances obtained by corrections for magnification.
b. 2 cases had meningitis only and 1 case had rhinorrhœa only.
c. 3 cases had rhinorrhœa only.

therapy or gonadal hormonal therapy, and in 3 patients adrenalectomy had previously been performed. As several patients were too ill to be fully assessed post-operatively, each set of results is quoted in terms of the number of patients so assessed. To show the effect of improvements in the implantation technique, the patients have been presented in two groups—those implanted before 1958, and those implanted during 1958—which together include all the cancer patients in whom we have implanted yttrium transnasally into the pituitary fossa.

Methods of Assessment

Pituitary function has been assessed approximately three-monthly.

Initially, at ten days after the implantation, the standard cortisone maintenance was withdrawn, and evidence of cortisone deficiency sought in the water-diuresis test and the T-wave depression on the electrocardiogram, and in the restoration of these by cortisone. If these tests were abnormal, cortisone insufficiency was also evident in the clinical picture. All the patients initially found to show hypopituitarism have required continuing cortisone treatment. When test evidence of adrenocortical insufficiency was obtained, thyroid function was assessed with radio-iodine and the urinary gonadotrophins were measured. When hypopituitarism was found, it involved all these three functions, when assessable.*

* Among the 22 patients assessed as hypopituitary, this was shown:
(*a*) In 14 cases by both thyroid and adrenocortical deficiencies.
(*b*) In 2 cases, previously adrenalectomised, by both thyroid deficiency and low urinary gonadotrophins.
(*c*) In 3 cases by adrenocortical and gonadotrophic deficiency.
(*d*) In 3 cases by adrenocortical deficiency alone.

The effects on the cancer.—As " subjective improvement " have been classed loss of pain, dyspnœa, headache, or vomiting, and an obvious improvement in vigour and activity. Objective improvement has been recorded only when some measurable lesion has diminished—whether a skeletal or pulmonary deposit, a superficial visible or palpable lesion, neurological signs, hypercalciuria, or hypercalcæmia.

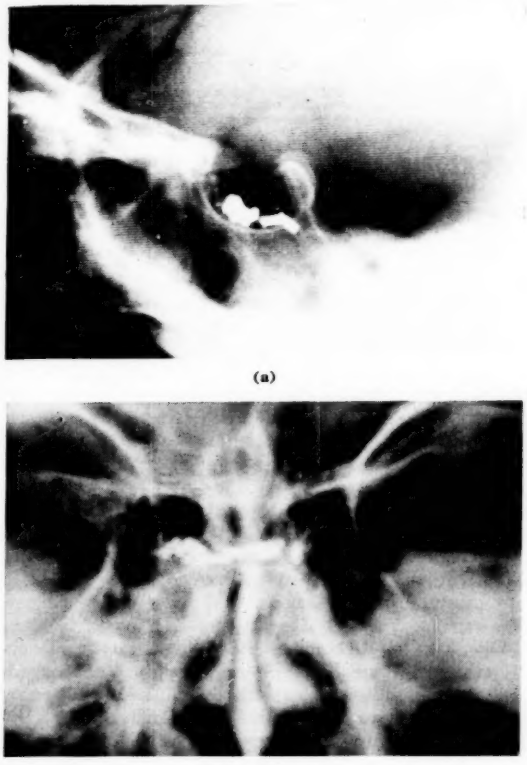
Results

Clinical Outcome

Table I summarises the main results in our small series. Both in the earlier and in the more recent group of patients, demonstrable hypopituitarism was induced in 80% of the patients. With this minor operative procedure, reimplantation is quite feasible when the functional effect has been incomplete. In all the surviving patients, hypopituitarism, once achieved, has appeared to persist on three-monthly testing. The clinical effect observed on the cancer—i.e., subjective and objective improvement in a third of all cases, and in half of those surviving long enough for assessment—is much the same as that following surgical hypophysectomy (e.g., Luft and Olivecrona 1953, 1957, Ray and Pearson 1956, Pearson et al. 1956, Baron et al. 1958). This clinical response also confirms the adequacy of the functional effect attainable by this method of pituitary ablation.

However, the complication-rate is too high to be satisfactory. The incidence of 4/12 in the 1958 series reflects an improvement over the earlier group, and, as indicated below, further reduction may be expected. Cerebrospinal-fluid rhinorrhœa is the main outstanding problem, though we may note that in 3 patients this ceased spontaneously. Of the 11 patients with rhinorrhœa or meningitis, 5 had both, 4 had rhinorrhœa only, and 2 had meningitis only. The ocular complications were mild and have been almost eliminated from the 1958 series. Though

Fig. 3—Seeds placed too high (1·5 mm. below diaphragma sellæ) causing perforation in diaphragma and fistula through gland to needle-hole in floor (necropsy) and persistent cerebrospinal-fluid rhinorrhœa. Seeds bunched too far anteriorly and hypopituitarism not achieved.



(a)

(b)

Fig. 4—All seeds well below diaphragma sellæ. Good distribution. Effective ablation and no complications.

1 patient died from a complication (meningitis), none of the others has suffered serious permanent disablement.

Cause of the Complications

On the skull X-rays taken after implantation, careful measurements (corrected for magnification) have been made of the distances from the diaphragma sellæ and the third-nerve landmarks to the nearest seed, and the results have been analysed in relation to the complications.* They confirm the importance of the danger areas defined under Methods.

From table II it will be seen that in 22 patients the seeds had been placed within 2·5 mm. of the diaphragma, and that in half of these patients rhinorrhœa or meningitis developed (e.g., fig. 3). Rhinorrhœa did not develop, however, in any patients with seeds more than 2·5 mm. from the diaphragma (e.g., fig. 4, a and b). In 3 of the patients with rhinorrhœa who were examined post mortem, the seeds were found just under a perforated diaphragma. Evidently such high seeds cause a perforation of the diaphragma, but in some cases the track may close lower down and rhinorrhœa is absent. Of the 6 patients with visual-field defects, all had a seed lying within 1 mm. of the diaphragma, and 3 had rhinorrhœa or meningitis.

These findings suggest that lower placing of the seeds, outside the danger area, should prevent these complications. In 20 patients the distance from the third-nerve landmarks to the nearest seed was measured on both sides; of the 3 who had shown a third-nerve paresis, 2 had seeds within 2 mm. of the nerve, and the 3rd a seed within 3 mm. of it. Of the 37 intact nerves, 35 had seeds lying over 3 mm. away, and the other 2 had a seed between 2 and 3 mm. away.

* No attempt has been made to allow for minor variations of the strength of the seeds, or their exact orientation.

Discussion

Our findings conform to the general clinical experience that pituitary ablation will give a useful remission in about half the cases of widespread secondary breast carcinoma, even when relapse has followed oophorectomy or adrenalectomy (Pearson et al. 1956). In these ill patients hypopituitarism is probably simpler to manage than adrenalectomy, since the problems of sodium-loss do not arise. In their effect on the cancer hypophysectomy and adrenalectomy have been found comparable (Atkins et al. 1957).

For pituitary destruction in ill patients, pituitary ablation by needle should be best, provided it can be done safely and effectively. Our results show that it can achieve adequate endocrine ablation, and they also show how to avoid the complications which have been the main objection to implantation by needle (Forrest et al. 1958, Moseley et al. 1958).

Summary

A technique of pituitary ablation by the pernasal needle implantation of multiple seeds of yttrium-90 is described.

It is suitable for the treatment of metastatic breast or other hormone-dependent carcinoma and has been used on 31 patients.

Functional hypopituitarism was achieved in 80% of assessable cases and objective improvement in the cancer in 65%.

Study of the radiological anatomy of the pituitary fossa has defined certain danger zones. Avoidance of these zones should minimise complications.

We wish to thank the Medical Research Council for providing one of the image intensifiers used in this project, the hospital physics department for the dosimetry, and our colleagues in the departments of radiotherapy, medicine, and surgery for referring patients.

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Appendix

Needle Introducer (fig. 5)

This has been designed to distribute the seeds throughout the gland from left and right puncture holes in the anterior wall of the fossa. It is made of stainless steel tube with an external diameter of 1·8 mm. The end has a solid tip ground to a sharp point to allow it to penetrate the base of the skull. 3 mm. from the tip of the needle there is a side-hole through which the seeds are pushed out into the gland (fig. 5c). The handle has a milled end so that it can be rotated easily, and a small marker on the handle indicates the direction in which the seed will be ejected. While the needle is being inserted, a trocar is kept in position to maintain the rigidity of the needle and

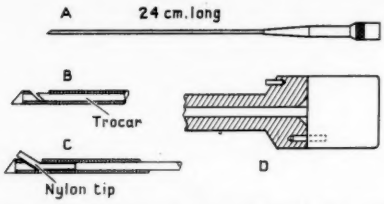

Fig. 5—(A) Needle introducer. (B) Needle tip with trocar in position (×1¼). (C) Tip, showing pusher with nylon tip (×1¼). (D) Handle of needle (×1¼).

block the lateral hole; thereafter, the seeds are pushed down the needle by a steel probe which has a flexible nylon tip to allow it to push the seed just beyond the lateral hole. The desired radial arrangement of seeds is obtained by rotating the needle to the positions required.

X-ray Equipment

The procedure is carried out on a standard X-ray screening table. Two Philips image intensifiers are employed for viewing the implant in the posteroanterior and lateral planes (fig. 2). The vertical intensifier, viewing the posteroanterior plane, replaces the fluorescent screen on the screening couch, and the horizontal intensifier, viewing the lateral plane, is mounted on a separate table. The position of the intensifiers is so arranged that the areas of the skull to be viewed can be easily seen without interfering unduly with the operator's access to the patient's nostrils. The whole procedure can be carried out without darkening the room. A tube setting of 75–80 kV and 2 mA is considered adequate for good visualisation of the pituitary fossa. The X-ray beams are coned down to the minimum aperture which will just cover the sphenoid and pituitary-fossa areas. The operator's hands never enter the main X-ray beam.

THE MODE OF ACTION OF ORAL ANTIDIABETIC COMPOUNDS

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ALTHOUGH oral antidiabetic compounds have been in general use for the past few years, their exact mode of action is still unknown. Attempts have been made to correlate the divergent data and theories about their mechanism (Lundbæk et al. 1958), but so far there is no conclusive evidence in favour of any of the theories propounded.

The purpose of our investigation was to find out whether, if these compounds inhibit liver glycogenolysis, they block the effect of known glycogenolytic substances. We selected compounds which resemble each other only in their glycogenolytic action and differ in chemical structure and other characteristics, and which are not associated in any other way with carbohydrate metabolism.

TABLE I

—	Control	Tolbutamide	Thyroxine	Thyroxine + tolbutamide	Tubocurarine	Tubocurarine + tolbutamide	Pituitary extract	Pituitary extract + tolbutamide
No. of rats	20	19	10	10	7	8	10	10
Mean glycogen content (g. per 100 g. liver) ..	0·93	0·90	0·67	1·00	0·66	0·90	0·52	0·85
S.D. ±	0·13	0·29	0·33	0·10	0·13	0·16	0·14	0·28

TABLE II

—	t	P
Control/pituitary extract	3·07	<0·01
Tolbutamide + pituitary extract/pituitary extract ..	2·92	<0·01
Control/tolbutamide	0·31	<0·5
Control/tubocurarine	1·67	0·1
Tubocurarine/tubocurarine + tolbutamide ..	3·23	<0·01
Thyroxine/control	1·76	0·05< P <0·1
Thyroxine/thyroxine + tolbutamide	2·42	<0·05

Thyroxine seemed to suit our purpose because its glycogenolytic effect appears within a few hours, long before any other effect. We tested also curare—the glycogenolytic action of which became known only recently (Müller 1957)—and an extract of the posterior lobe of the pituitary gland (Gömöri et al. 1932).

Our experiments were made on 94 male albino rats weighing 120–150 g., which had had no food for 24 hours. Glycogen was determined by the method of Good et al. (1933). In each experiment, 2 rats were given tolbutamide ('Rastinon' Hoechst) 50 mg. through a gastric tube, and 2 others were given thyroxine (Roche) 0·5 mg., or tubocurarine ('Tubarine' Burroughs Wellcome) 30 gamma, or extract of posterior-pituitary lobe ('Glanduitrin' Richter) 10 international units in subcutaneous injections. 2 more rats were given tolbutamide and the glycogenolytic substance simultaneously, and 2 rats serving as controls were submitted to the same procedure but were given physiological saline. The rats were decapitated 4 hours later and glycogen determinations were made on two liver slices.

Our results are shown in table I. The method has well-known sources of error, even under scrupulously set experimental conditions. Hence the results are interpreted statistically in table II.

Conclusions

Our results show that tolbutamide inhibits the glycogenolytic effect of thyroxine, curare, and posterior-pituitary extract when given simultaneously in the stated doses. These three substances appear to be similar only in their glycogenolytic action. Whether the glycogenolytic action is affected through the intervention of some other mechanism (e.g., insulin) remains to be explored. In the control of diabetes, these substances possibly exert their effect by impeding glycogenolysis, thus "defending" the glycogen content of the liver.

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"... The housewife throws away what is of no value to her and the higher the standard of living of a community the greater is the volume of refuse. Yet everything that is discarded has a value that can be estimated, and if we analyse domestic refuse and put against each item the price it can command in established markets, the value of domestic refuse works out at about thirty shillings per ton at the lowest and the value of all materials thrown out of British homes reaches twenty millions sterling yearly. The natural resources of the world cannot keep pace indefinitely with destruction on such a scale."—J. C. WYLIE, *The Waste of Civilization*; p. 107. London. 1959.

INSTABILITY OF RADIOACTIVE VITAMIN B_{12}

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RADIOACTIVE vitamin B_{12} is now widely used both for the diagnosis of megaloblastic anæmias and for the study of absorption mechanisms. Since the whole of this work depends upon the assumption that the radioactivity measures the vitamin, it is important that no other radioactive species should be present in the test material. This is especially so when the expected absorption from an oral dose is small, as in pernicious anæmia; false diagnoses might be made if, for example, the cobalt-containing breakdown products were better absorbed than the vitamin.

Between the years 1950 and 1957 I made some 25 batches of the vitamin labelled with cobalts 60, 56, or 58, or occasionally with a mixture containing a fair proportion of cobalt-57, and these were widely distributed in many countries (Smith et al. 1952, Bradley et al. 1954, Smith 1955). From time to time evidence came to light that a batch prepared some months previously had deteriorated to a degree that would not be expected for non-radioactive vitamin B_{12} stored under similar conditions. Mollin and Baker (1955) have already mentioned this phenomenon and have emphasised the need for frequent microbiological assays of solutions of radioactive vitamin B_{12}. Deterioration was erratic and did not seem to be correlated with one cobalt isotope rather than another, with high rather than with low specific activity, or with the concentration of the solution.

At first there was a tendency to blame adventitious causes, such as the phenol used as a preservative in the earlier batches, traces of alkali leached from ampoules or vials, or microbial contamination of the diluted solutions; but the trouble was not consistently prevented by eliminating these possibilities. In the end it became clear that destruction of the vitamin must be due to self-irradiation, though the effect is probably indirect. When a radioactive cobalt atom decays, the vitamin-B_{12} molecule in which it was present decomposes into *non-radioactive* impurities, so that the radiochemical purity is not directly affected. The resulting β and γ radiation is very unlikely to be absorbed by another vitamin-B_{12} molecule in so dilute a solution. It must, therefore, react with water molecules to yield hydrogen peroxide or some other substance capable of destroying the vitamin chemically. Destruction by this mechanism should, therefore, be prevented by storage in the dry state—an idea which will be tested, I understand, by the Radiochemical Centre.

In most instances, the final steps of purification were chromatography on paper and crystallisation. Naturally, therefore, freshly prepared material showed no more than traces of other radioactive species separable from the vitamin B_{12} by chromatography or electrophoresis on paper. Deterioration occurred, if at all, during storage of aqueous solutions nearly always in the dark, in a refrigerator or a deep-freeze cabinet. Samples of radioactive vitamin B_{12} made by Merck & Company in the United States, and by the Radiochemical Centre, Amersham, are also known to have deteriorated on occasion.

A few examples only will now be given to illustrate the erratic incidence of the phenomenon, the tests employed, and what little can be deduced about the breakdown products.

Methods

Radiochemical purity can be assessed by various means, and almost every laboratory using radioactive vitamin B_{12} could readily apply one or more of them to check its stocks, at, say, monthly intervals.

Absorption Spectroscopy

The breakdown products appear to be colourless or pale yellow, so that absorption spectroscopy or even simple colorimetry gives a moderately accurate measure of the residual vitamin B_{12}.

Microbiological Assay

The simplest test for most laboratories is a microbiological assay. Any of the usual assay organisms can be used, for there is no evidence of significant breakdown to other microbiologically active species (such as factor B, highly active in the *Escherichia coli* mutant plate test).

Isotope Dilution Assay

When carried out with proper precautions, the isotope dilution assay is the most specific technique (Smith 1956). The principle is to add a known amount of " cold " vitamin B_{12} to a measured sample, and to reisolate the vitamin in a state of purity, but not necessarily quantitatively. Measurements of its specific radioactivity permit calculation of the radioactivity associated with vitamin B_{12} in the sample. A conveniently large amount of carrier may be added without sacrificing accuracy (e.g., several milligrammes), but complete purification is essential. Recrystallisation, even repeatedly, is hardly adequate, and some form of chromatographic separation is advisable first: this can conveniently be chromatography on thick filterpaper, such as Whatman 3MM, with wet secondary butanol containing traces of acetic and hydrocyanic acids (Armitage et al. 1953).

Paper Chromatography

Chromatography, with or without added carrier, may be used more directly. The paper can be cut into sections for direct measurement of radioactivity with a Geiger-Müller or other type of counter. This gives some indication of the behaviour of the breakdown products; however, if any of them have about the same R_F as vitamin B_{12} itself, it will lead to an overestimate of the radioactivity associated with the vitamin.

Paper Electrophoresis

Electrophoresis on paper (Armitage et al. 1953), as used for serum-protein fractionation, for example, may similarly be used to fractionate the residual radioactive vitamin from other radioactive species, provided they are not also neutral like the vitamin (or acidic, if the electrophoresis is done in an alkaline buffer containing cyanide). It is advisable to separate at two or more different pH values: further, if the sample has been exposed to bright light for long periods, it is also advisable to add a trace of cyanide to convert other cobalamins (biologically active but not necessarily neutral) to cyanocobalamin.

Results

(1) An early batch of ^{60}cobalt-B_{12} showed 67% of its initial microbiological activity after 20 months' refrigerator storage, but only 3% after 34 months at room temperature. Most of the small stock remaining at 21 months was repurified by electrophoresis: the repurified material showed full microbiological activity 6 months later.

(2) Another batch labelled with cobalt-60 lost in 3 months 28% of its initial microbiological activity: a parallel direct colorimetric assay showed 78% of the initial value, the colour having become orange-red. Paper chromatography indicated 67% purity; on repurification of the batch by electrophoresis the recovery of pure radioactive vitamin B_{12} was 67%.

(3) A small batch labelled with cobalt-58 suffered even more rapid inactivation, to the extent of 50% in 2 months, as estimated by microbiolgical assay and confirmed by paper chromatography.

(4) A fermentation with cobalt-60 was carried out with no added " cold " cobalt or vitamin B_{12} to give a product of the highest attainable specific activity. All side-fractions were then

TABLE I—^{60}Co–B_{12} X1603 M: COLLECTED RESULTS

—	% of total counts			
	Chromatography		Electrophoresis	
	1st	2nd	pH 6·5 + CN⁻	pH 5·9 (NoCN⁻)
Vitamin B_{12} (maximum)	32	27	21	31
Lower R_F than B_{12}	63	68	..	..
Higher R_F than B_{12}	5	5	..	..
Ionised Co (maximum)	..	16	..	17
Basic	..	..	..	31
Acidic (at pH 6·5 with cyanide)	..	..	79	..
Acidic (at pH 5·9 without cyanide)	..	..	..	38

Microbiological assay for vitamin B_{12}	% of initial potency	—
Esch. coli tube (Shinfield)	31	
Esch. coli plate (Greenford; later assay)	29	
Lactobacillus leichmanii (Shinfield)	28	

reprocessed with added vitamin B_{12} to salvage additional labelled material, at lower specific activity but suitable for isotope dilution assays. Both lots were checked initially by paper chromatography of small aliquots. The high-activity material showed essentially all the radioactivity in the vitamin-B_{12} zone; the salvaged material was at least 98% pure. 6 months later, in another laboratory, an isotope-dilution assay on the salvaged material indicated that 20% of the radioactivity was not associated with the vitamin. Chromatography showed 25% and electrophoresis 23% of radioactivity in non-B_{12} zones, confirming the determination. The main batch was checked again by both techniques alongside, and found to be 95% pure. Thus the batch at lower specific activity had without doubt deteriorated much more than the material of high activity.

(5) Recently a batch of ^{60}cobalt-B_{12} made 13 months previously was reported to be giving anomalous results in rat experiments and to show only 30% of the initial activity by microbiological assay. A month later another ampoule from the same batch was opened and tested in replicate by three methods; the results in table I confirm the deterioration and show reasonable agreement one with another.

(6) A batch of ^{58}cobalt-B_{12} made at the Radiochemical Centre, Amersham, was examined at the same time with the results shown in table II. Although this material was only a month old, its radiochemical purity had fallen from the initial claimed value of 97% to about 75%.

The breakdown products present in both these last two batches appeared to be mainly acidic organic cobalt compounds (not inorganic cobalt) with lower R_F values than vitamin B_{12} in the secondary butanol solvent. Radioactivity was spread out between the origin and the vitamin-B_{12} zone with no sharp peaks, suggesting a number of decomposition products, as might be expected from so complex a molecule.

TABLE II—^{58}Co–B_{12} X1731 (AMERSHAM BATCH 22): COLLECTED RESULTS

—	% of total counts			
	Chromatography		Electrophoresis	
	1st	2nd	pH 6·5 +CN⁻	pH 5·9 (NoCN⁻)
Vitamin B_{12} (maximum)	74	71	68	78
Lower R_F than B_{12}	22	24	..	..
Higher R_F than B_{12}	4	5	..	..
Ionised Co (maximum)	..	8	..	1
Basic	..	..	..	2
Acidic (at pH 6·5 with cyanide)	..	..	32	..
Acidic (at pH 5·9 without cyanide)	..	..	..	20

Microbiological assay for vitamin B_{12}	% of initial potency	—
Esch. coli plate (Greenford)	85	
Euglena (Hammersmith)* †	78	

* Assay made 2 weeks later at the Postgraduate Medical School.
† Isotope dilution assay at the Radiochemical Centre (also at the later date) indicated a radiochemical purity of 78%.

Summary and Conclusions

Vitamin B_{12} labelled with any of the radioactive cobalt isotopes is liable to decompose on storage.

The rate is unpredictable and shows no evident correlation with specific activity, nature of the cobalt isotope, or concentration of the aqueous solution.

When deterioration occurs, radioactivity measurements are no longer a reliable indicator of vitamin-B_{12} content, because other radioactive cobalt compounds are present.

It is advisable that stocks should be retested for radiochemical purity at intervals of one month or less.

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EGG-CONTAINING MEALS AND BLOOD COAGULATION

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AFTER test-meals containing 2 eggs or 50 g. of butter, margarine, or hard vegetable cooking fat, O'Brien (1956) found similar shortening in the coagulation-time of recalcified plasma in the presence of Russell-viper venom (' Stypven '-time). Since the 2 eggs contained only 10 g. of glyceride fat but 3 g. of phospholipids, he suggested that eggs may owe their unusual activity in this respect to their large phospholipid content. Later experiments (O'Brien 1957a) appeared to support this hypothesis. He observed that 2·5 g. of egg lecithin, which was inactive in his in-vitro experiments, detectably shortened the stypven-time when ingested; and a phospholipid mixture (comprising less than 5% of triglyceride, about 30% of lecithin, 30% of phosphatidyl ethanolamine (PE), and 35% of inositol-containing phospholipids), when ingested in small amounts, produced a shortening of the stypven-time which was comparable to that observed after the ingestion of five times as much triglyceride. His conclusion was that a part of the phospholipids was absorbed relatively unchanged, and this could explain the marked response after phospholipid-containing egg meals.

This explanation is attractive because it has been shown that some phospholipids produce a remarkable activation of coagulation in vitro, especially in the presence of Russell-viper venom. But there are considerable discrepancies in experimental results, and opinions vary in regard to the phospholipids concerned (Barkhan et al. 1956, Poole and Robinson 1956a and b, O'Brien 1957b, Therriault and Nichols 1958). Some experiments support the idea that ingested phospholipids are absorbed unchanged (Artom and Swanson 1948, Bloom et al. 1954, Blomstrand 1955).

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TABLE I—WEIGHTS (G.) OF EGG LIPIDS PER MEAL

Diet	Total fat	Neutral fats	Phosphatidyl choline	Phosphatidyl ethanolamine
Whole eggs	13·5	10·8	2·2	0·5
Total lipid	13·5	10·8	2·2	0·5
PE-free lipid	13·0	10·8	2·2	0·001
PL-free lipid ..	13·5	13·5	0·0	0·0

The object of our present work was to see whether either of the two main phospholipids present in the egg is responsible for the claimed activity of ingested egg fat on blood coagulation.

Methods

Subjects, Test-meals and Procedure

Nine middle-aged physically normal men (chronic schizophrenic patients in the Hastings State Hospital), after 10 hours' fasting, were given breakfast of dry toast and jelly, coffee, and a scramble of either (*a*) 3 whole eggs, (*b*) 3 egg whites plus the total lipids of 3 eggs (total lipid), (*c*) 3 egg whites plus the lipids of 3 eggs from which the PE had been removed (PE-free lipid), (*d*) 3 egg whites plus egg lipids, equal in weight to the total lipids of 3 eggs, from which all phospholipids had been removed (PL-free lipid), (*e*) 3 egg whites, or (*f*) a virtually fat-free test-meal containing sucrose, rice, and non-fat milk solids providing 1078 calories. The subjects were divided into three groups and the test meals were rotated over 6 experiments conducted at weekly intervals.

Blood samples were taken 1 hour before, immediately before, and $3^1/_2$ and $4^1/_2$ hours after the meal was eaten; these are described in tables II and III as numbers 1, 2, 3, and 4 respectively. The subjects were under continuous supervision during the fasting period and remained seated in the laboratory during the experimental period. In all cases the complete meal was consumed. No smoking was allowed in the morning before or during the experiment.

Russell-viper Venom Accelerated Plasma-recalcification Time (Plasma Stypven-time)

All glassware in contact with the blood or plasma was siliconised by treatment with 'Siliclad' (Clay Adams, New York). 9 ml. of blood was drawn by clean venepuncture directly into 1 ml. of isotonic sodium-citrate solution using a siliconised no. 18 needle attached to silicone-rubber tubing. The plasma was separated by centrifugation at 1500 r.p.m. for 30 mintues (international centrifuge size 2), and pipetted off.

The plasma stypven-time was measured at 37°C. A simple photoelectric colorimeter utilising 10 × 50 mm. test-tubes was mounted in the waterbath, and 0·5 ml. portions of the citrated plasma were pipetted into the tubes. 1·0 ml. of isotonic saline, at 37°C, containing stypven (1/30,000) and 0·017 *M* calcium chloride was added from a syringe by vigorous injection to ensure thorough and instantaneous mixing. The optical density quickly attained a steady value, and the end-point of the coagulation was taken when the rapid increase of density occurred. Replicate determinations by this method showed a high degree of reproducibility, and all determinations were made in duplicate.

TABLE II—EFFECT OF MEALS ON WHOLE-BLOOD COAGULATION-TIME

Comparison	First tubes	Last tubes
Pre-meal: no. 2 minus no. 1 ..	−0·39 ± 0·59	−0·70 ± 0·79
Carbohydrate/protein meal:		
No. 3 minus no. 1 ..	−0·83 ± 0·87	−0·55 ± 1·72
„ 4 „ „ 1 ..	−0·55 ± 0·71	−1·78 ± 1·61
Egg white:		
No. 3 minus no. 1 ..	−1·28 ± 0·82	−2·83 ± 3·38
„ 4 „ „ 1 ..	−1·50 ± 0·99	−2·22 ± 2·27
Whole egg:		
No. 3 minus no. 1 ..	−1·00 ± 1·00	−2·11 ± 2·03
„ 4 „ „ 1 ..	−1·33 ± 0·94	+0·05 ± 2·31
Total lipid:		
No. 3 minus no. 1 ..	+0·72 ± 0·36	+1·11 ± 2·22
„ 4 „ „ 1 ..	+0·50 ± 0·95	+2·33 ± 3·11
PE-free lipid:		
No. 3 minus no. 1 ..	+0·44 ± 0·81	−0·67 ± 2·73
„ 4 „ „ 1 ..	0·05 ± 0·82	−0·94 ± 1·90
PL-free lipid:		
No. 3 minus no. 1* ..	+0·37 ± 0·64	+0·87 ± 1·57
„ 4 „ „ 1 ..	0·11 ± 0·15	+1·05 ± 1·42

Mean differences (± SE) between blood samples (min.) for nine subjects.
* Eight subjects only.
Blood samples 1 and 2 were drawn respectively 1 hour and immediately before the meal; 3 and 4 were drawn $3^1/_2$ and $4^1/_2$ hours after the meal.

Whole-blood Coagulation-time in Silicone Tubes

The general method was similar to that used by Buzina and Keys (1955), but the tilting was started in the first 2 tubes simultaneously; tilting of the 5th and 6th tubes also was started simultaneously after clotting had occurred successively in the 3rd and 4th tubes. The reported coagulation-times of the "first tubes" and "last tubes" are the means of these pairs of tubes.

TABLE III—EFFECT OF MEALS ON PLASMA STYPVEN-TIME

Comparison	Difference (sec.)			
	Mean	SE	*t*	P
Pre-meal: no. 2 minus no. 1 ..	−2·26	±0·53	4·23	0·01
Carbohydrate/protein meal:				
No. 3 minus no. 1	−0·58	±1·20	..	..
„ 4 „ „ 1	−3·85	±1·42	2·71	0·05
Egg white:				
No. 3 minus no. 1	−3·14	±1·58	1·99	..
„ 4 „ „ 1	−2·20	±1·46	1·51	..
Whole egg:				
No. 3 minus no. 1	−9·26	±1·68	5·50	0·001
„ 4 „ „ 1	−7·67	±1·74	4·39	0·01
Total lipid:				
No. 3 minus no. 1	−7·09	±1·53	4·62	0·01
„ 4 „ „ 1	−7·94	±1·27	6·27	0·001
PE-free lipid:				
No. 3 minus no. 1	−7·32	±1·52	4·81	0·01
„ 4 „ „ 1	−7·02	±0·72	9·79	0·001
PL-free lipid:				
No. 3 minus no. 1	−6·85	±1·70	4·03	0·01
„ 4 „ „ 1	−7·34	±0·72	10·23	0·001

Mean differences (± SE) and probability (P) of chance occurrence; nine men in each comparison.

Lipids in the Test-meals

With the cooperation of the department of poultry husbandry of the University of Minnesota, eggs from hens in the same pen were used less than 48 hours after they had been laid. Essentially quantitative methods were used for the separation of egg-yolk lipids (Rhodes and Lea 1957). Lipid preparations were freed from organic solvents by vacuum evaporation at low temperature (Lea et al. 1951), then kept for 1 hour at 60°C under high vacuum. No flavours or odours from residual solvents were noted during cooking or eating. Fats were kept under nitrogen as far as possible, and were stored when necessary at −20°C in vacuo.

Total egg-yolk lipids were obtained by extraction of the lyophilised separated yolks with methanol-chloroform (1/1). PL-free lipids were obtained by treating lyophilised yolks with acetone three times in a blender, recovering the lipid extract, and passing it through a column of silicic acid in chloroform solution. The phosphorus content of the effluent was negligible.

For the preparation of PE-free lipids, the egg cephalins were removed by chromatography on alumina in methanol-chloroform (1/1). In this way 18·1% of the lipid phosphorus was adsorbed on the column, and the ninhydrin reaction (Lea and Rhodes 1955) measured directly on the lipids was reduced to 0·2% of the initial value, indicating that the removal of PE was 99·8% complete.

The amounts and composition of the lipids fed are summarised in table I.

Analysis of Results

Because of the difficulty of standardising the activity of the stypven solution from batch to batch or day to day, the experiments were designed to allow a statistical analysis of the results in terms of the changes in coagulation-time as measured using

the same solution of the accelerating agent. Each individual was his own control for the pre-meal to post-meal change, and, since he received all of the test-meals, for the comparison of the meals.

Results

Whole-blood Coagulation

The fasting whole-blood clotting-times as measured by the first tubes ranged from 22 to 38 minutes, with a mean of 27 minutes; as measured by the last tubes the range was 32 to 60, and the mean value was 42 minutes.

Table II summarises the changes in the whole-blood clotting-times as measured in the siliconised system. No significant changes were observed after any of the test-meals.

Plasma Stypven-time

The fasting plasma stypven-times as measured by the present method ranged between 27 and 49 seconds, the mean of 6 determinations on the nine men being 39·7 seconds. The changes in the stypven-times are summarised in table III. Significant shortening of the stypven-time occurred after all the lipid meals but not after the egg-white or carbohydrate meals. No differences were observed between the effects of the various lipids, and in particular the meals containing egg phospholipids were no more effective than those containing neutral fats only.

Discussion

The results of our study do not support the suggestions of O'Brien (1956, 1957a) that the shortening of the stypven-time after eating eggs is due to the phospholipids contained in them. We have no data to show whether the total lipid of eggs is more effective than an equal quantity of any other food fat, but such effect as it has is clearly not dependent upon either the total phospholipid or the phosphatidyl ethanolamine content. When feeding other fats, we have observed that a meal providing as much as 120 g. of butterfat, for example, produces about twice the absolute shortening in plasma stypven-time as that now reported for the 13·5 g. of fat in the yolks of 3 eggs.

On the other hand it is possible that changes in the amount or physical state of the phospholipids of the blood-lipoproteins are responsible for the acceleration of stypven clotting-time after a fat meal, and that these changes are induced by the ingestion of either neutral fats or phospholipid, probably through the formation of chylomicrons containing newly synthesised triglyceride fat (Deuel 1955). In this case endogenous phospholipid is involved in the acceleration and exogenous phospholipid is not required. It will be recalled that O'Brien (1957b) obtained acceleration from an ingested mixture of lecithin and phospholipids, though lecithin was not active in vitro.

Summary

The total lipid of 3 eggs (13·5 g.) produces a significant shortening in the Russell-viper venom accelerated recalcified plasma coagulation-times ('Stypven'-time) at $3^1/_2$ and $4^1/_2$ hours after ingestion. Removal of the total phospholipid or of the phosphatidyl ethanolamine from the egg lipid does not significantly alter the result. The whole-blood coagulation-time (in siliconised tubes) is not significantly shortened by the ingestion of this amount of egg lipids.

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References at foot of next column

AN OUTBREAK OF S. BOVIS-MORBIFICANS INFECTION IN A CHILDREN'S WARD

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CASES of salmonella infection arise from time to time without obvious cause or connection with other incidents. The outbreak described here shows how such cases originate. In this outbreak only 3 cases were clinically apparent, but the infection was kept going for two and a half months by 10 symptomless excreters among patients and staff. These symptomless excreters were detected only because the fæces of every child in the ward were routinely examined on admission and once every week thereafter.

Previous Outbreaks

A few outbreaks due to *Salmonella bovis-morbificans* infection have been recorded; these were either of the explosive food-poisoning type or were marked by a more gradual case-to-case spread.

Sladden and Scott (1927) reported an outbreak of 39 cases of gastroenteritis presumed to have been caused by infected pressed-beef. Pleydell (1949) described a small outbreak affecting 12 persons who had eaten beef sandwiches. Miller et al. (1955) described a very large outbreak of food-poisoning due to meat pies which affected over 1100 persons, of whom 5 died. Outbreaks of infection in hospitals, affecting mainly young children, have also been reported. Angrist and Mollov (1946) described a small outbreak in a premature-baby unit in which 6 babies were affected; 3 were symptomless excreters and 3 had only mild diarrhœa. Mackerras and Mackerras (1949) reported a very large and serious epidemic of gastroenteritis in Brisbane in 1947 which affected nearly 400 patients. Most of the cases were in young children in hospitals and other institutions. The fatality-rate was 38% (49/128) of those from whom the organism was isolated.

Present Outbreak

On Feb. 17, 1958, a girl of 6 months was admitted to the children's ward with a provisional diagnosis of intussusception, having been ill for a week with diarrhœa, associated with blood and mucus in the fæces. No surgical cause for her symptoms was found, but two days later *S. bovis-morbificans* was isolated from her fæces. Her father drove a lorry used for transporting cattle; and the same organism was isolated from a swab taken from the floor of the lorry, although the inside of the lorry had been cleaned out with cresol and soap solution ('Lysol') before the swab was taken. There was no history of illness in the

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DATA ON OUTBREAK

Case no.	Date of admission to hospital (1958)	Date fæces positive for *S. bovis-morbificans* (1958)	Age at onset of infection	Symptoms	Duration of excretion of *S. bovis-morbificans*•
1	Feb. 17	Feb. 17	6 mos.	Severe	15 weeks
2	Jan. 1	March 7	5 mos.	Mild	17 weeks
3	March 2	,, 14	6 weeks	Moderate	10 weeks
4	,, 19	,, 31	2 weeks	Nil	10 weeks
5	Feb. 25	April 1	4 weeks	Nil	13 weeks
6	April 1	,, 3	3 days	Nil	Still positive after 44 weeks
7	March 7	,, 3	1 mo.	Nil	Still positive after 42 weeks
8	(Nurse)	,, 3	Adult	Nil	3 days
9	(Nurse)	,, 3	Adult	Nil	3 days
10	April 14	,, 21	5 mos.	Nil	5 weeks
11	,, 19	,, 21	2 days	Nil	15 weeks
12	(Nurse)	,, 29	Adult	Nil	1 week
13	(Nurse)	May 1	Adult	Nil	1 week

• Estimated to the date of the first of three consecutive negative specimens.

family, but in an examination of fæces from family contacts *S. bovis-morbificans* was isolated from the patient's brother (aged 9) on one occasion. Several specimens of fæces from the father and the mother were negative for salmonella organisms. The patient, who had never been in her father's lorry, probably acquired the infection from her brother, who sometimes travelled in it.

On March 7, two and a half weeks after the original patient was admitted, *S. bovis-morbificans* was isolated from the fæces of a baby in the ward who had developed mild diarrhœa. During the next three weeks, 5 further children who had been admitted to the ward with other illnesses were found to be excreting the same organism; 4 of these children were symptomless excreters. In a search for a carrier among the staff, 2 nurses were also found to be symptomless excreters. Both were put off duty; they proved to be only transient excreters and had three consecutive negative specimens within ten days. Three weeks later, on April 21, 2 more babies were found to be symptomless excreters of *S. bovis-morbificans*. In a second search for carriers among the staff 2 further nurses were found to be excreting this organism; they also were only transitory symptomless excreters, and in ten days had three consecutive negative specimens. The sequence of these events is shown in the accompanying table.

The problem was to determine how the infection was spread, since all 16 beds were in single cubicles. Specimens were taken from different parts of the ward, kitchen, babies' feeds, and the ward scales and other furnishings; samples of ward dust and settling-plates exposed in the ward cubicles were examined for salmonellæ. On several occasions the hands of the nursing staff were examined for these organisms in the course of their work and without any previous warning. All samples were negative.

On reviewing the laundry arrangements, however, it was found that the dirty napkins were immersed in 40% benzalkonium chloride (' Roccal ') for twelve hours and then put through a domestic mangle by the nurses in an annexe, before being sent to the laundry. There was considerable splashing, and numerous colonies of fæcal-type *Escherichia coli* were grown on settling-plates during this process.

It was thought that the nurses might have acquired their infection from the mangling of the babies' napkins. To test this hypothesis, pieces of gauze lightly smeared with fæces from one of the excreters were immersed in 40% benzalkonium chloride and left at room temperature for twelve hours. No difficulty was found in isolating salmonellæ after this experimental benzalkonium chloride treatment. The experiment was repeated using (1) cresol and soap solution 1 in 40, and (2) a proprietary phenol disinfectant of the " white fluid " type at a dilution of 1 in 640. (For disinfection, the manufacturers recommend that the linen be soaked for twelve hours at a dilution of 1 in 1200.) Salmonella organisms were not isolated from the specimens treated with cresol and soap solution, but they survived treatment in " white fluid " for twelve hours under the conditions of the experiment.

Discussion

The committee set up by the Medical Research Council (1944) to study cross-infection in hospitals recommended that napkins should not be scrubbed in the ward, but should be put in a bin containing " white fluid " (1 in 160) before being boiled in the laundry. We would emphasise that, although dirty napkins have been soaked in a disinfectant, they should be regarded as being infective until they have been sterilised by heat. Penetration of fæces by chemical disinfectants is slow, and it can never be assumed that all bacteria have been killed.

In the outbreak described here, from the beginning of April to the end of May the *S. bovis-morbificans* infection which had been introduced into the ward was latent and 10 symptomless excreters were detected. The extension of the outbreak in this period was known only because the babies' fæces were routinely examined. The periodic examination of fæces from children in a ward is of value, not only to obtain an early diagnosis, but also to prevent cross-infection. Children are very susceptible to intestinal infection, and their mortality-rate is very much higher than that of older patients.

Besides *S. typhi*, other organisms of the salmonella group may partly depend on symptomless excreters for their survival during interepidemic periods, and may later cause further cases when suitable conditions arise.

In the latter part of the outbreak, although the organism was readily transmitted, it did not even cause symptoms in children with other illnesses. The children were carriers considerably longer than the adults. Two of the children were still excreting salmonella ten months after they were first infected, and this caused understandable anxiety in their parents, even though the children were symptom-free.

The epidemiological course of an outbreak of cross-infection due to *S. derby* in children's wards in Melbourne, described by Mushin (1948) and Rubbo (1948), was somewhat similar to that of the present outbreak. Mushin and Rubbo isolated the salmonella from the dust of the children's wards and from a communal roller towel, and reported convincing evidence that the infection was spread by sporadic contamination of the individual infant's feeds, either by dust or by direct contact with the nurses' hands.

The route by which the infection reached the babies in the present outbreak was not conclusively demonstrated. The small number of cases with symptoms suggested a low dosage of the infecting organism, such as would occur if the infection were spread by hands. On some occasions the nurse who changed the babies' napkins had also to prepare the feeds, so possibly the babies may have been infected from the feeds; but this was thought to be

unlikely because the nurses were well aware of this danger and took every precaution to prevent it.

The nurses probably became infected while handling the dirty napkins, or during the subsequent mangling process, when large numbers of fæcal organisms were disseminated. Investigations recently summarised by Banks (1958) have indicated that the conjunctiva may be a route of transmission of infection, and the nurses may have been infected in this way.

Summary

In an outbreak of *S. bovis-morbificans* infection in a children's ward 9 children and 4 nurses were infected.

Only 3 of the children showed clinical manifestations of infection. The extent of the outbreak became apparent only from routine weekly bacteriological examination of all the children's fæces.

Infection may have been spread during the mangling of napkins, which were assumed to have been sterilised by immersion in a disinfectant. Tests showed that the disinfectant was ineffective.

We would like to thank Sister Helen Wallis, who was in charge of the ward; the medical officers of health of Dartmouth, Launceston, Plymouth, and Plympton St. Mary; and Mr. R. Osborne, public health inspector, Plympton St. Mary, who obtained the swab from the lorry.

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COMPLETE HEART-BLOCK

SUCCESSFUL USE OF AN ELECTRONIC PACEMAKER AFTER CLOSURE OF VENTRICULAR SEPTAL DEFECT

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A MAJOR hazard of open heart surgery for the closure of ventricular septal defect is damage to the heart's conduction mechanism. Attempts to treat the consequent heart-block, which is often complete, were at first confined to the use of sympathomimetic drugs, particularly isoprenaline sulphate (Lillehei 1957). Though the reduction in mortality from surgically induced heart-block by isoprenaline has been quoted at 50% (Weirich et al. 1958), its effect has been erratic and difficult to control. External stimulation of the heart has also been employed (Zoll 1952, Linenthal et al. 1954); but this has many practical disadvantages such as skin burns, painful skeletal muscle contractions, and difficulty in keeping the electrodes properly applied for long periods.

Attention has recently been paid to the direct stimulation of the ventricles by an electrode sewn into the heart and connected to a pacemaker. The following is an account of a case in which this method was successfully used.

Case-report

A girl, aged 7, was admitted to Guy's Hospital in October, 1958, for closure of her ventricular septal defect. Catheterisation of the right side of the heart in 1957 had shown a change in oxygen-saturation consistent with this diagnosis. The systolic pressure in the pulmonary artery was 80 mm. Hg, with a pulmonary resistance of 7 units. In spite of this high resistance there was evidence of a sizeable left-to-right shunt, in that the lung fields were heavily vascularised, and there was a well-marked mitral diastolic-flow murmur. The right ventricle was moderately powerful on clinical examination, but a pre-operative electrocardiogram (E.C.G.) showed balanced ventricles. There was no clubbing or cyanosis, and symptoms had been absent apart from some chest infections in the previous year.

She was digitalised before operation, which was performed by Sir Russell Brock on Nov. 3.

Through a median sternotomy incision the pericardium was opened to show local conditions characteristic of a ventricular septal defect. The aorta was of a small normal size, but the pulmonary artery was fully twice its normal size; the right ventricle was very powerful and filled the operating field. A complete cardiac bypass was maintained for 32 minutes. The heart was arrested for 28 minutes by the use of potassium citrate. Through a right ventriculotomy a ventricular septal defect, measuring $2{\cdot}25 \times 1{\cdot}75$ cm., was seen to extend back 0·75 cm. beyond the aortic ring, lifting up the tricuspid-mitral ring. The defect was closed with 8 interrupted mattress sutures. When the clamp was removed from the aorta at the end of the bypass ventricular fibrillation occurred, but this responded immediately to electric defibrillation. For the next 5 minutes the heart appeared to be in sinus rhythm; then the ventricular-rate suddenly slowed. There was a changing 2/1–3/1 atrio-ventricular block which, after 10 minutes, became complete (atrioventricular dissociation) with a ventricular rate of 50 per min.

The bared ends of two electrodes were sewn into the anterior surface of the right ventricle about 2 cm. apart. Each was retained in place by two fine silk sutures. One electrode was to act as a stimulator, and the other as a spare. An indifferent electrode was implanted in the right pectoralis major muscle. All three leads were brought to the exterior through separate small incisions, and anchored to the skin.

The heart's action was at first satisfactory; but 80 minutes after the end of the bypass, because of a continued inadequate ventricular rate of about 55 per min., the electrodes were connected to an artificial pacemaker adjusted to maintain a rate of 120 per min.

At the end of the operation the patient recovered quickly from anæsthesia. There was at no time any suggestion of neurological damage. The pacemaker, set to deliver 4·0 volts (which was just above the minimum voltage necessary to cause the heart beats to follow the pacemaker consistently), accompanied the patient to the ward. There an E.C.G.-monitoring oscilloscope was connected, and remained in constant use for 3 weeks whilst the pacemaker was attached. The rate of 120 per min. was similar to the postoperative rate of patients who had undergone similar operations without developing heart-block.

The heart-block and its management by the pacemaker was the only postoperative complication encountered. The blood-pressure with the pacemaker in use varied from 90/60 mm. Hg to 110/70; the extremities were warm, and the urinary output was normal.

On the 2nd day the patient suddenly became pulseless, pale, rigid, and inarticulate for 10 seconds, recovering spontaneously.

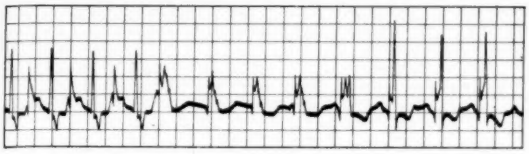

Fig. 1—E.C.G. showing competition between the artificial and natural pacemakers.

This must have been due to temporary cardiac arrest, and closely resembled a Stokes-Adams seizure. We thought the development of an inflammatory reaction around the myocardial electrode had made 4·0 volts temporarily insufficient to cause ventricular contraction, and the pacemaker was readjusted to give 6·5 volts. Attempts were made over the next 36 hours to reduce the voltage below the stimulating threshold; but there was asystole until the voltage was returned to its former level 5 seconds later. On the 4th day P-waves could be clearly distinguished amongst bizarre E.C.G. complexes; the rate was regular at 120 per min. The voltage was turned down completely, and the pacemaker was switched off. The heart maintained its own rate of 80–90 per min. with a blood-pressure of 95/55 mm. Hg until the 8th day. The patient then had a similar attack to the one on the 2nd day; the pacemaker, set at 6·5 volts and a rate of 110 per min., was switched on and took control of the ventricles immediately. $2^1/_4$ hours later, when the E.C.G. complexes were again bizarre though P-waves were recognisable, the apparatus was switched off without ill effect. For the next 3 days it was used intermittently on six occasions for periods varying from 20 minutes to 24 hours. It was switched on whenever the patient became pale, restless, or rigid, and the nurse was unable to feel a pulse. During this time the efficacy of the spare heart lead was tested for 2 hours. The stimulator was turned off only under medical supervision, when P-waves and spontaneous ventricular complexes were seen in addition to the pacemaker impulses on the oscilloscope. At these times E.C.G. traces by a bedside direct-writing instrument showed competition between the artificial and natural pacemakers (fig. 1).

From the 11th day, when isoprenaline 5 mg. t.d.s. was given by mouth, there was no further use for the pacemaker. On the 13th day the dosage was increased to 5 mg. four-hourly except during sleep, but was reduced to 5 mg. t.d.s. a week later after a brief attack of palpitation, and isoprenaline was discontinued 11 days later. During this period the pulse-rate varied between 80 and 120 per min.

On the 21st postoperative day, after abundant evidence that the heart was in sinus rhythm (with a right bundle-branch block—fig. 2), the child was well sedated and the pacemaker leads were removed. With slight traction they came away cleanly, causing very little pain; there was no evidence of infection at the stab incisions.

There were no contractions as a result of stimulation of the muscle into which the indifferent electrode was inserted. The use of the pacemaker caused no distress to the child. Though apprehensive and inclined to be frightened by the apparatus at first, she soon became used to it, and enjoyed watching the oscilloscope.

After the leads were removed she began to get up, and was discharged from hospital a month after operation. Her E.C.G. still showed sinus rhythm with a right bundle-branch block. She is still very well, and had had no unpleasant symptoms.

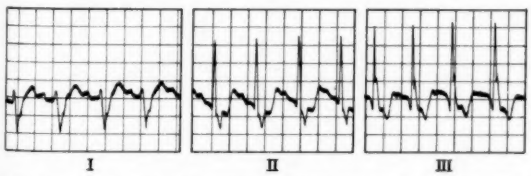

Fig. 2—E.C.G. when the pacemaker was removed, showing sinus rhythm with a right bundle-branch block.

Discussion

The Pacemaker and Electrodes

The pacemaker, developed in the physics department at Guy's Hospital, will be the subject of a later article. Briefly, it is an easily portable instrument, measuring $10 \times 7 \times 6$ in., powered by three small batteries contained inside. These were supplemented by others outside the instrument when portability was no longer necessary, and were tested daily while the instrument was in use. The controls comprise an off/on switch, a frequency control (continuously variable from 80 to 180 pulses per min.), a voltage control (variable from 0·07 to 15 volts), and a pulse-width control enabling selection of 0·3, 1·0, and 3·0 millisec. (in this patient a pulse-width of 1·0 millisec. was used). It develops a rectangular pulse wave. At each pulse from the pacemaker there is a quiet click. The advantages of a battery-powered instrument are portability and independence of power-supply failures and fluctuations.

The leads inserted into the patient were three 2-ft. lengths of plastic - covered, six-strand, fine wiring as used in telephone equipment. Each strand had a thin textile core wound round with fine tin-plated copper ribbon. Although the spare heart lead and the indifferent lead (which was the cathode) were recovered in excellent condition, we found that the heart lead (which had been in use as the anode) had undergone a considerable amount of electrolysis where contact had been made with the heart. In any future case we shall attach importance to making the indifferent electrode the anode. If this should cease to work, an external plate (e.g., an E.C.G. plate) could immediately serve as well. Moreover, if this arrangement were employed probably less voltage would be necessary.

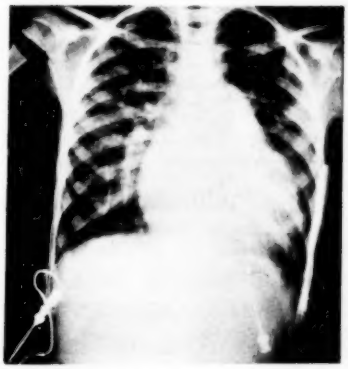

Fig. 3—Postoperative chest radiograph, showing the pacemaker's leads in situ.

The other ends of the patient's leads were passed through and fixed on to wide-bore Luer needles, which were then connected to the pacemaker's leads via Luer adaptors. Each lead and its connections were coiled and tucked between pieces of strapping, as shown in the post-operative chest radiograph (fig. 3).

The Vigil

A nurse who had been specially instructed was constantly with the patient. Besides keeping frequent records, it was nearly always the nurse's responsibility to recognise the patient's state. She paid attention to the patient and the pulse rather than to the oscilloscope. She had also been instructed in the emergency actions that might be necessary if the patient became pulseless while the pacemaker was already in use (e.g., checking leads, changing to the spare lead, and increasing the voltage).

Weaning from the Pacemaker

It may have been fortuitous that after starting isoprenaline there was no further need for the pacemaker,

but in any future case we should probably take this measure earlier. Digitalis was continued postoperatively for 10 days. It was used for its tonic effect on the myocardium, bearing in mind the high pulmonary resistance and pulmonary arterial pressure, although we realised that it might delay recovery of the damaged conduction mechanism. No evidence of right-sided cardiac insufficiency was observed postoperatively.

The E.C.G. oscilloscope was an invaluable aid in deciding when to switch off the pacemaker, although critical study of E.C.G. traces was only possible with permanent records.

Summary

The successful use of an external electronic pacemaker is described and discussed with reference to a case of ventricular septal defect, which at operation sustained damage to the conduction mechanism causing complete heart-block.

We should like to thank Sir Russell Brock for permission to publish this case, which was referred by Dr. Charles Baker.

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Preliminary Communications

THE USE OF ALCOHOL-STERILISED ARTERY SEGMENTS FOR GRAFTS

No major surgical centre should consider itself properly equipped if it is without an arterial bank. Indeed, now that the indications and technique for arterial grafting are standardised, the operation can be carried out in many smaller units where there is a surgeon interested in the subject. On the other hand, the complexity of most methods previously described has made the management of an arterial bank a difficult matter for small hospitals. In 1952, when such banks were first established in this country, the arterial segments were removed in the post-mortem room under aseptic conditions, rapidly frozen, and stored at −78°C. But the practical difficulty of obtaining sterile arteries was soon apparent, and techniques were introduced for the sterilisation of vessels taken under clean but not aseptic conditions. In addition, arteries were lyophilised for storage, to obviate the expense of regular deliveries of solid carbon dioxide which was used to maintain the low temperatures then thought to be necessary. The most popular sterilising techniques have been those involving the use of ethylene oxide, and more recently β-propriolactone.

Our aim has been to develop a technique which is both simple and inexpensive, which can be set up by any surgeon who is interested, and which at the same time affords the maximum economy of graft material.

COLLECTION AND STORAGE

The arteries are collected under clean but not aseptic conditions. Any subject dying under 40 years of age is suitable, and the vessels are removed within 24 hours of death. The abdominal aorta, both iliac arteries, and both femoral arteries are removed in a single piece with some surrounding tissue.

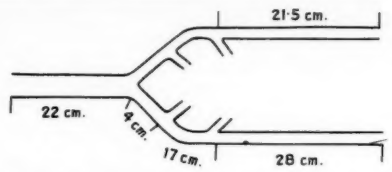

Fig. 1—To show the method of recording the unstretched length of artery on the record card.

This material is usually dissected immediately, though it may, if necessary, be placed in the deep freeze until the opportunity arises. All non-vascular tissue is cleaned away, leaving the branches as long as possible. It is washed in saline to remove debris and blood-clots, and examined for the presence of atheroma or other pathological conditions.

At this stage the details of the graft are entered on a record card. The sex, age, and date and cause of death of the donor are recorded, together with a diagram giving details of the unstretched length of each named artery on the graft. For convenience a ' Perspex ' stencil of the aorta and its branches is made, from which a simple outline diagram can be drawn on the record card in a few seconds (fig. 1).

The graft is stored in a single piece in a plastic bag, which is marked with an identity number; ileostomy bags have proved suitable for this purpose. The graft is laid flat on the floor of an ordinary commercial deep-freeze unit, and when frozen

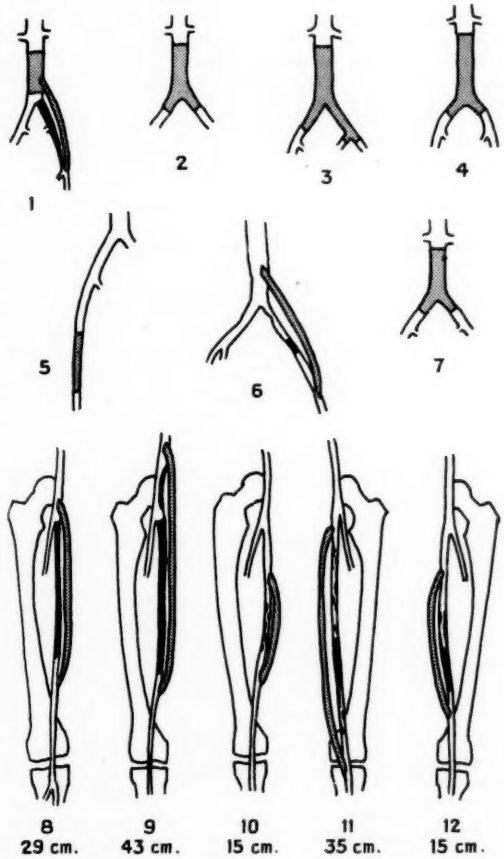

Fig. 2—Various alcohol-sterilised arterial grafts (these operations were performed between August, 1957, and June, 1958).

hard is suspended from a bar in the same unit for convenience of inspection and selection. We have abandoned the technique of rapid freezing. The longest time that a graft has been kept before use is 4 months, but we think that grafts could be kept at this temperature for much longer.

STERILISATION

When an operation which requires a graft is undertaken, a suitable non-sterile artery is selected from the bank. It is thawed, and immersed in 70% alcohol for 20 minutes, care being taken to fill the lumen. It is then transferred to a bowl containing normal saline and irrigated. After washing it is ready for ligation of arterial branches in the usual way.

When there is difficulty over the supply of grafts, the exact length required can be cut after the occluded length has been exposed in the patient. In this way only the piece of artery required is sterilised, and the rest is returned to cold storage. Repeated sterilisation with alcohol is not advisable, because this hardens the graft.

The use of alcohol-sterilised grafts in experimental animals was described by Moore et al.,[1] but they also stored the segments in alcohol before use. Warren [2] found that the use of such grafts in man was not easy, because of the unpredictable degree of hardness which made suturing difficult. Immersion in 70% alcohol for 20 minutes causes very little physical change in the artery; it becomes slightly harder and tougher, but is very easy and convenient to suture.

1. Moore, T. C., Riberi, A., Kajikuri, H. *Surg. Gynec. Obstet.* 1956, **103**, 155.
2. Warren, R. Personal communication, 1957.

RESULTS

During the past year we have gradually changed to this technique for the preparation of arterial grafts, and we now use it as a routine. The earlier cases were limited to aortic grafts, because we felt that the risk of thrombosis might be greater in femoral grafts. But no primary thrombosis has occurred. Fig. 2 shows the variety and length of the grafts which have been inserted.

Cuttings from the grafts sent for culture have not shown any organism other than occasional contaminants, and the segments are histologically indistinguishable from normal vessels.

There has been one late disaster (no. 2). This patient died suddenly while taking very vigorous exercise 3 months after his operation. The necropsy was performed at the city mortuary, and the graft was not saved for histological investigation, but it was said to look very healthy; the patient's death was due to rupture of one of the iliac suture lines. All the other patients are well, with patent grafts.

SUMMARY

A simplified technique for the sterilisation of arterial-graft segments by immersion in 70% alcohol for 20 minutes is described.

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NEWLY RECOGNISED MYXOVIRUSES IN EUROPE

LAST year Chanock et al.[1] reported the isolation of two new viruses named HA1 and HA2 from small children who were hospital patients and from inmates of a children's home in Washington, D.C. These viruses were detected by the technique of hæmadsorption (adherence of red blood-cells to infected tissue-culture cells) and belonged to the myxovirus group.

In February, 1958, an outbreak of respiratory illness occurred in a residential nursery in Sheffield. This consisted of a running nose, mild fever, and a cough, and lasted from a few days up to four weeks. In spite of the duration of the symptoms and the widespread rhonchi which were frequently heard, the children were only mildly ill. The cases resembled those described by Spence et al.[2] as "coryzal bronchitis". Of 18 infants, aged from 3 months to $3\frac{1}{2}$ years, 15 were affected.

Fifty-five throat swabs from these were inoculated into monkey-kidney tissue cultures by two of us (R. N. P. S. and S. K. R. C.) and a virus was isolated from 6 of the children, including 1 who was not ill. Hæmagglutinins for chicken and human cells appeared in the media, and, on further passage, mild degenerative changes in the tissue cultures were seen. Paired sera from 3 children from whom virus was isolated showed 16-fold rises in hæmagglutination-inhibition titre against the virus and a rise against a complement-fixing antigen prepared from cells of infected tissue-cultures.

One strain of the virus has now been compared with a number of others and appears to be serologically identical with the HA1 strain of Chanock, as is shown in the accompanying table. The results of these tests have been confirmed by similar neutralisation tests. The table also shows that the strain Cop 222, which was isolated from a child in Copenhagen with an influenza-like illness by Petersen and von Magnus,[3] is serologically identical with strain HA2. These are the first strains of HA1 and HA2 to be isolated in Europe—in both cases in laboratories in which the prototype strain had not been received. Complete clinical and epidemiological data on the Sheffield studies will be reported elsewhere.

ANTIGENIC RELATION BETWEEN VIRUSES FROM EUROPE AND STRAINS ISOLATED IN U.S.A. DEMONSTRATED BY HÆMAGGLUTINATION-INHIBITION TESTS *

Hæmagglutinating virus used	Titre of serum of rabbit immunised with:			
	HA1	HA2	Cop 222	Sheffield "Moss"
Sheffield "Moss"	1600	<50	<50	1280
HA1	600	<50	<50	640
HA2	<50	300	600	<40
Cop 222	<50	100	450	40

* Sera were treated with cholera filtrate.

We wish to thank Prof. C. H. Stuart-Harris for much encouragement and advice; the children's department of the City of Sheffield for permission to study children in the Moss nursery; Dr. R. M. Chanock for supplying prototype viruses and sera, and Dr. B. K. Petersen for the strain Cop 222.

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2. Spence, J., Walton, W. S., Miller, F. J. W., Court, S. D. M. A Thousand Families in Newcastle on Tyne. Oxford, 1954.
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Reviews of Books

Staphylococcus Pyogenes

STEPHEN ELEK, M.D., D.SC., PH.D., D.P.H., professor of bacteriology, University of London, consulting bacteriologist, St. George's Hospital. Edinburgh: E. & S. Livingstone. 1958. Pp. 767. 84*s*.

THIS book provides a succinct account of all the most important work on the morphology, metabolism, distribution, and pathogenic properties of staphylococci. Its substance is derived from several disciplines, and Professor Elek feels that this mingling of ideas will lead to fresh advances. He marshals well his vast material (there are some 4000 references), and sets out the various topics fluently and coherently. Probably the best chapter is that describing the discovery of coagulase, its mode of action, its taxonomic significance, and its possible role in disease. This work can be recommended to all interested in staphylococci—particularly to medical bacteriologists and to biochemists and geneticists, who are finding the staphylococcus a useful model.

Practical Blood Grouping

F. STRATTON, M.D., D.SC., D.P.H., director, Blood Transfusion Service, Manchester; P. H. RENTON, M.D., B.SC., deputy director. Oxford: Blackwell Scientific Publications. 1958. Pp. 331. 42*s*.

THERE are two kinds of books about blood-groups. The first kind describes their historical development, their immunology, their inheritance, and so on; the second is the "cookery book" type which gives the details, usually in numbered steps, of all the procedures necessary for determining blood-groups, estimating antibody titres, and similar practical matters. The aim of Dr. Stratton and Dr. Renton has been to blend these two approaches by explaining, as they go along, the reasons why particular procedures are carried out. Thus anyone who reads this book and masters the contents will not only know everything necessary about practical blood-grouping but will also, on the way, have acquired a good insight into factual knowledge and theoretical views about blood-groups as a whole. Pitfalls are fully discussed—for instance, a whole chapter is devoted to false results in agglutination tests. The organisation of large-scale ABO-grouping for blood-banks and of an antenatal blood-grouping service is described in detail. This work is an excellent single-volume guide for anyone who has to cope in a practical way with blood-groups.

Mental Deficiency

The Changing Outlook. Edited by ANN M. CLARKE and A. D. B. CLARKE. London: Methuen. 1958. Pp. 513. 45*s*.

SINCE the 1939–45 war interest in mental deficiency has grown steadily. The war itself called attention to the social implications of the defective in the community, and emphasised what could be done by special training and in selected environments; and biochemical research has thrown some light on the ætiology of certain types of defect, and so provoked fresh thinking on systems of classification. And now a Bill is before Parliament to repeal the old Mental Deficiency Acts, among others, and to regularise the voluntary admission of defectives—which has in fact been taking place since the Royal Commission reported.

This book is therefore opportune. It has been written entirely by psychologists, who have accomplished an immense amount of study—there are 30 pages of references—and have clearly described, documented, and criticised all the salient work. This volume's greatest service is that it shows the former attitude of complacent custody replaced by one of hopeful training and treatment. This change must be impressed on the public if its outlook is to be changed. The defective's social needs, in and out of hospital, should be met by a comprehensive programme; and this can only be based on an enlightened attitude in the whole community.

Tumors and Tumorous Conditions of the Bones and Joints

HENRY L. JAFFE, M.D., director of laboratories and pathologist, Hospital for Joint Diseases, New York, consultant, Armed Forces Institute of Pathology, Washington, D.C. London: Henry Kimpton. 1958. Pp. 629. 135*s*.

A GREAT deal of our present knowledge of bone tumours derives from American research. From the work of the American Bone Sarcoma Registry and studies by such men as Coley, Copeland, and Geschickter has emerged a pattern for classification and treatment, where before there was confusion. Dr. Jaffe, one of the most distinguished of the United States workers, has now published a comprehensive and authoritative volume.

Almost every page of the text is interleaved with photomicrographs and radiographs. In all there are thirty-two chapters, each concerned with a particular tumour or group of tumours, and describing the clinical features, X-ray characteristics, pathology, and prognosis and—rather more briefly—treatment. This is, of course, essentially a work of reference. But surgeons, pathologists, and radiologists in every English-speaking country will presently see it on library shelves; and, when they do so, they should make a point of reading at least the initial chapter, which gives a wise and simple introduction.

Milestones in Modern Surgery

By ALFRED HURWITZ, M.D., professor of surgery, State University of New York College of Medicine, director of surgery, Maimonides Hospital, New York; GEORGE A. DEGENSHEIN, M.D., assistant attending surgeon, Maimonides Hospital, New York. London: Cassell. 1958. Pp. 520. 112*s*. 6*d*.

"THE past," Sir William Osler said, "is a good nurse, particularly for the weanlings of the fold." Some such precept must have prompted the authors of this book. They have collected about thirty articles, prefacing each with a short biography of its author. Examples are Spencer Wells' original description of his forceps, and Halsted's first report of his radical mastectomy. Chronologically the contents range from Ambroise Paré's writings to a 1956 monograph on homotransplantation of the human kidney. The collection might have been given a more international flavour: two-thirds of the papers are American. But, as J. Englebert Dunphy points out in his foreword, the value of some books can best be measured, not by what they contain, but by their stimulating effect on the reader. There can be no doubt about the stimulus afforded by this beautifully produced work, and there is room for more like it.

The Nursing and Management of Skin Diseases (London: Faber & Faber. 1958. Pp. 288. 32*s*. 6*d*.).—This is a fine book. Nursing the skin case, whether in the hospital, the factory, or the home, can be a miserable business. Yet, if undertaken with knowledge, care, and patience, it can be most rewarding. Dr. D. S. Wilkinson here offers knowledge in abundance. His book will be of special value to industrial, school, and district nurses; if they know its contents thoroughly, they will be better equipped than many of their medical supervisors. Indeed, the general practitioner or industrial medical officer will find here much which will help him in the management of the "dermatological tenth" of his practice.

Biological Laboratory Data (London: Methuen. New York: John Wiley. 1958. Pp. 132. 15*s*.).—We all remember the varied valuables we carried around in our schoolboy pockets. Here is an erudite equivalent—a collection of miscellaneous data not often found in a small book. It is perhaps the expanded notebook of the author, Dr. L. J. Hale, who is a lecturer in zoology at Edinburgh University. Logarithmic tables, differentials, interrelationships of units for measuring length, area, volume, temperature, and weight, simple statistical formulæ, atomic numbers, series of pH indicators, compositions of buffers, different saline solutions, culture-media, short summaries of histological procedures, photographic formulæ, Imperial standard wire gauge, Birmingham sheet gauge, a summary of symbols for correcting printed proofs—these are only some of the ingredients of this useful compendium.

THE LANCET

LONDON 21 FEBRUARY 1959

The Cranbrook Report

MUCH objection has been taken to the system whereby the care of a woman in pregnancy and childbirth is commonly divided between the three separate parts of the National Health Service—hospitals, general practice, and local health authorities. Given enough good will, any system can be made to work; and this one works fairly well because the patient forms a bond between all who are concerned with her, so that they become a team. Usually the bond is strong enough to ensure that she gets whatever care and treatment she needs. But not always. An occasional woman is booked for home confinement though she has a history of previous difficulty in labour, or even of previous cæsarean section or severe third-stage bleeding; by contrast another woman will be kept in hospital or maternity home for 10–14 days when she could easily be allowed home earlier. Some midwives actively discourage their patients from having medical care, and there are general practitioners so possessive that they do not allow the midwife any antenatal responsibility and refrain from calling in a consultant until the last moment. Likewise consultants are open to criticism if they insist on supervising the whole of the patient's pregnancy, labour, and puerperium when the family doctor could easily take a substantial share in it, with benefit to all. Even the mother herself can prevent the best kind of cooperation, by insisting too forcibly that she knows what is best for her.

Though they may not be common, these faults in rational management are recurrent, and the Cranbrook Committee's report [1] must be judged according to whether it will reduce them. It is an interesting document which shows very clearly the big local differences in the existing maternity services, and the big differences of opinion on how they should be organised in future. Since the committee favours a compromise, its report is likely to be bitterly criticised yet on the whole accepted. Of its 59 separate conclusions and recommendations, only a few are really controversial. For example:

(1) The tripartite structure of the maternity service is to be retained.

(2) Hospital beds are recommended for 70% of all deliveries, with normally a 10-day stay for the patient. Also antenatal beds for 20–25% of all pregnant women.

(3) For inclusion on the obstetric list a general practitioner will normally have to have done 6 months' resident work under a consultant in an obstetric unit, and only those on the obstetric list will be paid a fee for maternity services. (The committee feels that the practitioner who is not on the list should not receive a fee for maternity services, since he is not offering any special skill.)

(4) The local authority will continue to provide facilities, but the committee hopes that in time the G.P.-obstetrician will replace the clinic medical officer.

Various coordinating measures are proposed, including the setting up of local professional "maternity liaison committees" and the general adoption of cooperation cards.

In principle, a service in which the patient can have the aid, as required, of consultant, practitioner, and midwife can hardly be bettered. Even if her pregnancy seems completely normal, its course may eventually require the services of all three, and of their supporting organisations. But we wonder why the Cranbrook Committee did not recommend that all patients, besides having a general practitioner and a midwife, should also see a consultant early in pregnancy and again before term. To make the best arrangements for each patient is by no means always easy; and, as Mr. FITZGERALD shows on p. 403, this is work for which the consultant's special experience ought to be used because it can often be useful. Yet, though the committee has a good deal to say about hospitals notifying the family doctor, the G.P.-obstetrician, and the local authority when they book a case, nothing is said about notification of the consultant when a patient is booked for delivery at home. If teamwork is really to be the order of the day, consultants or their effective deputies ought surely to have an opportunity to examine, once or twice, all cases not booked for hospital. Despite their other responsibilities, this work should be within their compass, and it would help in forging professional ties between those practising obstetrics inside and outside hospital.

Whatever general plan is adopted, difficulties, disagreements, tactics, and development will sometimes need to be argued out. Hence we welcome the suggestion that local maternity liaison committees should be set up; and we hope that their constitution will be such that each of the three groups represented will feel that it is properly represented—no one group being able to lord it over the others. (That the midwives should be given their full share of administrative responsibility is particularly important.) So that these local maternity committees—which will be advising hospital management committees, executive councils, and local supervising authorities—shall not feel isolated or impotent, we suggest that they should have access (perhaps through regional committees similarly constituted) to a Central Maternity Services Committee which could back them effectively if satisfactory local developments are hampered—as may well happen if more beds are to be provided. In the absence of a "united maternity service" such as many would like to see established, a central body of this kind could do much to emphasise the fact that the three kinds of authority are all working with the single object of preserving the life and health of mother and child.

1. Ministry of Health: Report of the Maternity Services Committee. H.M. Stationery Office. 1959. Pp. 125. 6s. 6d. The committee was appointed in April, 1956, and its members were the Earl of CRANBROOK (chairman), Dr. A. BEAUCHAMP, Mr. G. F. GIBBERD, F.R.C.O.G., Sir BASIL GIBSON, Dr. V. W. HOWELLS, Dr. JEAN MACKINTOSH, Mr. H. J. MALKIN, F.R.C.O.G., Lady PAKENHAM, Miss V. SHAND, S.C.M., Dr. J. FOREST SMITH, Miss M. WILLIAMS, S.C.M., and Mrs. GEOFFREY WILSON.

To have enough beds for the delivery of 70% of women in hospital would be an improvement on the present state of affairs, and should ensure that none who need hospital confinement have to stay at home. But if 30% of deliveries remain domiciliary, there will still be need for emergency domiciliary midwifery, flying squads, and the like; and some may say that arrangements that mean that even a handful of women have to be snatched from the jaws of death are an anachronism. It would probably be safer if, in towns of any size, nearly all women were confined in an institution, and if (as Mr. FITZGERALD proposes) a large proportion of them were then discharged early, thus reducing the pressure on beds. In one unit on which we have information, about 10% of all admissions are managed in this way, with early discharge. But a real obstacle to such arrangements is the barrier—an iron curtain, some call it—between the domiciliary and the institutional midwives. Their eventual integration is to be hoped for; but the committee does not think it immediately practicable.

The committee suggests that the extra beds to be supplied should be for the use of the G.P.-obstetrician, whose position it evidently wants to strengthen. But this can be done only if he continues to have enough experience to maintain his competence. As we have already said, the committee would limit admission to the obstetric list to practitioners who have held a 6 months' residency in obstetric units, and it also thinks that the list should be reviewed every 3 years, with strict conditions for retention. This will not be welcome in every quarter; but the committee is right in wanting to discourage " dabbling in midwifery ".[2] Some, too, may differ from the committee on the right relation between the G.P.-obstetrician and (where he is someone else) the family doctor. On this the report says that " a general practitioner has overall responsibility for all his patients whether they are delivered by a general practitioner obstetrician or in a hospital ", and he should be informed of any maternity booking and of any abnormalities or illnesses. This seems reasonable; but on the other side it can be argued that already we may have three people caring for the woman, and surely ought not to make it four. In practice, of course, the family doctor unwilling to do midwifery often refers his patient to hospital rather than to a colleague who is a G.P.-obstetrician.

The unique character of maternity work, and the strength of the three arms of the present maternity service, not to mention the very good results that are being achieved with the service as it is, made it likely that the recommendations of Lord CRANBROOK's committee would be towards development rather than revolution. Though nobody will be wholly pleased with the report, few who study it carefully will be ready to reject it outright. If a real effort is made to ensure that no one member of the obstetric team shall monopolise the patient to the exclusion of the others, and if a flexible yet effective administration is achieved, we should at least be able to hope that, in the differing areas of this country, improvement will always be continuous, if slow.

2. Russell, C. S. *Lancet*, 1956, ii, 68.

Cancer of the Prostate

CAREFUL postmortem dissections have revealed the startling fact that more than a third of men over 50 may have cancer of the prostate, and that only a relatively small proportion of these neoplasms declare themselves during life.[1 2] Even if we could detect all cases clinically or in the laboratory, we should still be unable to predict whether any particular case was of the latent or of the lethal variety. FRANKS, FERGUSSON, and MURNAGHAN [3] have sought prognostic pointers; and, though their series is too small for statistical analysis, their findings justify important, if largely negative, conclusions.

Using routine clinical and laboratory methods, they compared 32 patients who had survived for five or more years from the time of diagnosis (irrespective of the time of onset of symptoms) with 53 patients who had died earlier. In 24 cases of the first group and in 26 cases of the second, histological sections from biopsy specimens obtained at the time of diagnosis were available; and all who had survived for less than five years had come to necropsy, where the diagnosis and probable cause of death was established histologically. Absence of metastases was a characteristic feature at the time of diagnosis in patients who survived for five or more years; but almost half of those who survived for less than five years had no metastases at the time of diagnosis and a change in the prostate on endocrine treatment from " clinically malignant " to " clinically benign " by no means always portended long survival. With most types of cancer clinicians have come to rely on pathologists for a rough indication of a tumour's malignancy and perhaps of its likelihood to respond to different forms of treatment. A prostatic cancer, like cancer in any other site, can look more or less malignant under the microscope; but its microscopic appearance is unrelated either to its biological malignancy or to its responsiveness to therapy. We can thus do little more than echo JACOB's [4] question: if " routine examination can be expected to lead to a positive histological diagnosis in about one out of every four patients, can we justify the logical sequel, a radical prostatectomy on all these patients who are fit for operation but many of whom are experiencing neither local nor general effects ? " On the one hand, the early, often symptomless carcinoma is the most suitable for surgical eradication; on the other hand, such a lesion may remain dormant indefinitely. In the face of such uncertainty, most family doctors and specialists continue to depend on endocrine therapy as the basis of management.

Hormone therapy was originally based on the theoretical assumption that, since many prostatic cancers are well differentiated, their response to deprivation of hormonal stimulus would closely resemble that of the normal gland.[5] In fact, though the clinical results of castration and of œstrogen medication proved perhaps even more dramatic than had been expected, the res-

1. Franks, L. M. *Lancet*, 1956, ii, 1037.
2. See *ibid.* 1958, i, 1259.
3. Franks, L. M., Fergusson J. D., Murnaghan, G. F. *Brit. J. Cancer*, 1958, **12**, 321.
4. Jacobs, A. *Brit. J. Urol.* 1958, **30**, 381.
5. Huggins, C., Hodges, C. V. *Cancer Res.* 1941, **1**, 293.

ponsiveness of individual growths could in no way be related to their degree of differentiation. The striking histological changes which can follow administration of hormones may be found equally in the most differentiated and the most anaplastic cell; and some of the least differentiated cancers prove most hormone-dependent. Indeed, FRANKS [6] has suggested that the very concept of "hormone dependence" (now firmly entrenched in clinicopathological parlance) should properly be restricted to individual cells and not applied to whole tumours. His hypothesis that sensitivity to hormones may vary from one part of the same tumour to another threatens with extinction another convenient notion; but it is supported by evidence. Even in those growths where widespread degenerative changes develop under the impact of endocrine therapy, a few cells usually show no signs of damage; in some cases treatment halts the primary growth without retarding the secondary deposits; and sometimes soft-tissue and bony metastases from the same primary react in sharply divergent ways. Such puzzling observations must be interpreted against a background of still incomplete experimental data. We do not know, for example, whether œstrogens act directly on tumour cells or indirectly by suppressing pituitary activity; we do not know whether their effect is truly endocrine or "pharmacological" (treatment doses being far in excess of those that produce physiological changes); and we cannot explain why they depress the output of pituitary gonadotrophins, whereas castration (which is equally effective in treatment) increases the output. Finally, contrary to what might be expected if the original antiandrogenic concept of endocrine therapy was completely correct, androgens do not stimulate the growth of all prostatic cancers; occasionally they even seem to retard growth.[7 8]

Tumour cells are derived from normal tissue, and STEINER [9] raised the important question whether the responsiveness of certain tumours to hormones might depend, not on their malignancy, but on their retaining some of the properties of normal cells. FRANKS believes that "endocrine treatment [probably] affects the cell's residual normal properties rather than the neoplastic ones, even though the tumour cell may not always respond in exactly the same fashion as the normal parent tissue. The ratio of the normal to the neoplastic component may diminish as the tumour develops, with corresponding loss of hormone sensitivity". He uses the term "neoplastic component" advisedly, since we do not know whether each cell contains a mixture of normal and neoplastic material or whether each tumour consists of varying proportions of normal and neoplastic cells. In either case the concept implies that, though clearer understanding of the endocrine regulation of the normal prostate may allow us to control more accurately the normal element in prostatic cancer, for the control of the cancerous element we shall need altogether different weapons.

6. Franks, L. M. *Brit. J. Urol.* 1958, **30**, 383.
7. Trunnell, J. B., Duffy, B. J. *Trans. N.Y. Acad. Sci.* 1950, **12**, 238.
8. Pearson, O. *Cancer Res.* 1957, **17**, 473.
9. Steiner, P. *ibid.* 1957, p. 480.

Meanwhile, the search for new and more potent endocrine preparations continues—and with it the need for a cautious, even hypercritical, frame of mind. It has been claimed that certain phosphorylated œstrogens which can be given intravenously as well as by mouth actually enter the cancer cell, that the phosphatic group is split off there by acid phosphatase, and that the œstrogen is deposited in cytotoxic concentrations as insoluble diethyl-stilbœstrol. In a limited trial of stilbœstrol-diphosphate FERGUSSON [10] gained the impression that this preparation was not notably superior to stilbœstrol, and that any beneficial effect could probably be ascribed to higher dosage.[10] Studies with radioactive stilbœstrol-diphosphate, undertaken to see whether it was, in fact, concentrated in sites where phosphatase activity is high, suggested that accumulation of the compound in the prostate is negligible.

70–75% of all treated patients with prostatic cancer and 85% of all diagnosed but untreated patients die within three years; and this group includes an estimated fifth of patients who do not respond to endocrine treatment and who die within a year. These figures [6] are a stark reminder of the limitations of hormone therapy in terms of survival. After three years the difference in survival-rate between treated and untreated cases progressively widens. Patients who survive for more than five years on treatment represent 25% of all treated cases; but, since 5% of untreated patients also survive, definite prolongation of life cannot be attributed to therapy in more than 20%. This 5% of survivors among the untreated constitutes a challenge to the research-worker. These fortunate few seem to have an effective natural defence against their cancer—or they and their cancer arrive at a modus vivendi. The mechanism may be simple—if only we could see it.

"Auto-immunity"

"IMMUNITY" is a word that has had to put up with a good deal of ill-usage. In its original legal sense it was well enough defined; it meant exemption from the need to pay certain taxes or perform certain duties. The early bacteriologists adopted it to signify resistance to infection: not altogether a happy choice, since "immunity" in this sense usually implies not complete resistance to disease but rather a state of partial tolerance which has no legal counterpart. The study of the reactions of animals to infection with microorganisms later became so complex that a new branch of science arose under the inelegant title of "immunology". A substantial portion of this discipline is now concerned not with resistance to infection but with the somewhat analogous reactions when foreign substances are injected into animals—a subdivision sometimes known as "immunochemistry". We have learnt to tolerate another variant of this overworked word in the form of "auto-immunity". When first heard this strange term sounds as if it might have been coined by the psychoanalysts to describe an upheaval in the unconscious. In fact, it is applied to certain disease states in which the serum of an individual is

10. Fergusson, J. D. *Brit. J. Urol.* 1958, **30**, 397.

suspected of containing antibodies directed against a constituent of his own body.

Whatever the semantic merits of this concept, there can be no doubt of its popularity. Several sections of the Royal Society of Medicine have held discussions on auto-immunity, and these gatherings have been exceptionally well attended. A meeting of the Section of Medicine on Jan. 27 was notable as an attempt to bring together apparent instances of auto-immunity from widely separate fields. Prof. G. A. SMART dealt with renal and thyroid disease, Prof. E. G. L. BYWATERS with lupus erythematosus and rheumatoid arthritis, and Prof. J. V. DACIE with hæmolytic anæmia. It is a bold, and as yet unproved, hypothesis that these varied conditions have anything much in common. The status of acute nephritis is perhaps the most ambiguous, since it depends almost entirely on references drawn from animal experiments. GLYNN and HOLBOROW [1] suggested that the condition may be caused by a kidney-damaging antibody directed against some body constituent which has been rendered antigenic by contact with specific streptococci. The case for regarding nephrosis as an auto-immune condition seems no stronger, for it rests mainly on the alleged curative effect of steroid therapy. In thyroid disease antibodies against extracts of the gland can be detected with almost embarrassing frequency.[2] Broadly speaking, there is general agreement about the reality of the antibodies, but much less confidence in the proposition that they necessarily cause tissue damage.

Perhaps the most fascinating of the so-called auto-antibodies are those found in what Professor BYWATERS no longer permits us to call the "collagen diseases". The most conspicuous member of this now anonymous group—disseminated lupus erythematosus (D.L.E.)—is characterised by the L.E. cell in bone-marrow and circulating blood.[3] The essential feature of the L.E. phenomenon is now taken to be phagocytosis of nuclear material by leucocytes. This can be reproduced in vitro by the use of serum from cases of D.L.E. The serum factor is a γ-globulin,[4] which is absorbed by the nuclei of tissue slices.[5] Professor BYWATERS has demonstrated the deposition of L.E. factor on the nuclei of various tissues, identifying it by means of a fluorescent anti-γ-globulin serum. On one occasion he observed this phenomenon when using serum and tissue from the same patient. He therefore suggests that the L.E. factor may provisionally be regarded as an auto-antibody, apparently directed against the desoxyribose nucleic acid contained in all cells, since it will react with this material in vitro. The wide distribution of the antigen is reminiscent of GAJDUSEK's [6] observations on complement-fixation by certain pathological sera against an antigen complex present in various human and animal tissues. It is notable that the highest titres were found in D.L.E., "lupoid" hepatitis, and macroglobulinæmia. But there was no direct correlation with the presence of the L.E. phenomenon, and it seems unlikely that GAJDUSEK's antibody is identical with L.E. factor.

The Waaler-Rose factor seems to be related to rheumatoid arthritis in much the same way as L.E. factor is to D.L.E. As the sensitivity of the reaction is improved, so the proportion of cases of rheumatoid arthritis which react in this way approaches more nearly to 100%. This factor also is a γ-globulin, but it is a much larger molecule than most others in this group. The antigen against which it is directed is still unidentified, but present evidence indicates that it is what BYWATERS described as a "slightly shop-soiled γ-globulin". This was presumably a paraphrase of the suggestion by GLYNN et al.[7] that it might be an antibody to reactive γ-globulin groups which had become exposed as a result of the combination of other antibodies with specific antigens. The groups in question were pictured as normally protected by coiling of the γ-globulin molecule when not conjoined with antigen.

Professor DACIE discussed those cases of acquired hæmolytic anæmia which appear to be due to antibody action. Here there is good evidence that a substance is carried in the γ-globulin fraction of the patient's serum which will adhere to his own red blood-cells and cause them to become lysed, mainly in the spleen. This is very similar to the situation which EHRLICH [8] tried without success to produce experimentally. He injected a large quantity of lysed goat blood into the peritoneal cavity of a goat; a little later antibodies were detected in the serum of the injected animal by their hæmolytic effect on the red blood-cells of all the other goats tested. Such serum had not the slightest action on the red blood-cells of the injected goat itself. This experiment led EHRLICH to enunciate the doctrine of *horror autotoxicus*—that is, that the body avoids making antibodies which might damage its own tissues. That some such mechanism must exist is evident enough, but it is difficult to imagine how it works. The failure of EHRLICH's goat to make antibodies against its own red cells can scarcely have been due to absence from the injected red cells of antigens in common with its own. It is difficult to avoid some such hypothesis as BURNET's [9] to the effect that all antigens carry a "self-marker" which enables the antibody-producing cells to recognise them.

EHRLICH's negative experiment using red cells may be contrasted with WITEBSKY's [10] positive experiment using thyroid extract. WITEBSKY immunised rabbits with thyroid extracts prepared from other rabbits. Their serum later contained antibodies which reacted not only with extracts of other rabbits' thyroids but also with extracts of their own thyroids. Moreover in many of the immunised rabbits destructive changes were observed in the intact thyroid glands. Antibodies could also be produced by injecting a rabbit with extracts of its own thyroid. Thus rabbits can make antibodies against their own thyroids, but goats do not make antibodies against

1. Glynn, L. E., Holborow, E. J. *Lancet*, 1952, ii, 449.
2. See *ibid.* 1958, ii, 1049.
3. Hargreaves, M. M., Richmond, H., Morton, R. *Proc. Mayo Clin.* 1949, **24**, 234.
4. Haserick, J., Lewis, L., Borte, D. *Amer. J. med. Sci.* 1950, **219**, 660.
5. Miescher, P., Fanconnel, L. *Experientia*, 1954, **10**, 252.
6. Gajdusek, D. C. *Arch. intern. Med.* 1958, **101**, 9.
7. Glynn, L. E., Holborow, E. J., Johnson, G. D. *Proc. R. Soc. Med.* 1957, **50**, 469.
8. Ehrlich, P., Morgenroth, J. *Berl. klin. Wschr.* 1900, **37**, 453.
9. Burnet, F. M., Fenner, F. The Production of Antibodies. Melbourne, 1949.
10. Witebsky, E., Rose, N. R. *J. Immunol.* 1956, **76**, 408.

their own red cells. The usual explanation of this discrepancy is that the thyroid antibodies are directed against colloid in the acini which normally does not come in contact with antibody-forming cells. This may well be true, but another explanation might be derived from the fact that WITEBSKY used Freund adjuvants in his experiments, whereas EHRLICH did not. Possibly these adjuvants modify either the antigen or the body's response to it in such a way as to obliterate the effect of the self-marker. Although this speculation is quite unsupported it might lead to some interesting experiments.

At present no useful generalisations can be made; and there is nothing to tell us whether antibodies arise because of failure to acquire tolerance, because of subtle alterations in the chemical constitution of the antigens, or because some derangement of the antibody-forming mechanism renders it incapable of recognising self-markers. Professor DACIE suggested that in some cases the antibody might be made by neoplastic tissue rather than by normal antibody-forming tissues. These alternative explanations all seem at present about equally plausible. The pathogenesis of the various conditions discussed may well be heterogeneous. What is more important than the correctness of any detailed hypothesis is that a new idea has appeared in medical thought, and is going to give rise to a great deal of original work.

Annotations

ARMCHAIR AND ANTICOAGULANTS FOR CARDIAC INFARCTION

IN 1952 Levine and Lown [1] suggested that strict bed rest was not the best way of treating patients with cardiac infarction; and they proposed that, as soon as the initial shock had passed, patients could sit up in a comfortable armchair for some hours every day; they cited records of 81 patients so treated with a mortality of only 10%. One reason for adopting this sort of regime was to reduce the incidence of secondary embolism. It is agreed that anticoagulant treatment prevents this secondary embolism, and much of the reduction of mortality brought about by anticoagulant treatment is apparently related to this action. Helander [2] in Stockholm has been testing the effect of combining armchair treatment and anticoagulants, to see whether mortality from cardiac infarction can be further reduced.

The patients who were having the "armchair treatment" were allowed up within the first six to seven days; they sat up in their armchairs as long as they liked, they fed and washed themselves, and they were allowed to read. Usually symptoms of shock were allowed to subside before the patient was got into his chair, but if pulmonary œdema appeared the patients were got up earlier. In the third week patients were allowed to walk in the ward, and in the fourth week they could go into the corridor; after four weeks they usually went home. Helander divided his patients into three groups: (1) armchair cases treated with anticoagulant (dicoumarol); (2) armchair cases not treated with anticoagulant; and (3) cases treated with strict bed rest in the usual way and given anticoagulant. There were 112 patients in the first group, 100 in the second, and 80 in the third. Patients who died within twenty-four hours of admission were not included, and the others were classified into three groups according to severity: group I comprised patients with all the clinical symptoms and signs of cardiac infarction, with shock and a fall in blood-pressure; group-II patients had the usual signs of cardiac infarction, with fever, increased erythrocyte-sedimentation rate, and leucocytosis; group III comprised the mildest cases, which "could be distinguished from angina pectoris only with the help of an E.C.G. tracing". These three groups were more or less evenly distributed among the treatment groups, except for some preponderance of rather more severe cases in the bed-rest group.

The figures show that for group I, the most severe cases, the mortality for the two armchair groups was about the same (23% with anticoagulants and 20% without); but the mortality in those treated by bed rest was 44%. For group II, the moderately severe cases, the mortality figures were: armchair plus anticoagulant 6%, armchair without anticoagulant 16%, bed rest with anticoagulant 22%. In group III there were no deaths in any of the treatment groups.

These mortality figures, taken at their face value, suggest that there is a decided advantage in getting patients out of bed as soon as possible; but such a straightforward interpretation is hardly justified. Many deaths in the severe group occurred during the second or third day after onset, but only 1 of these patients was sitting up when he died; the others "belonged to a group which was meant to sit up, if surviving". Furthermore, embolism played a relatively small part as an immediate cause of death in all treatment groups; progressive cardiac failure, presumed extension of the infarction, or sudden death with or without preceding arrhythmia were the causes of most deaths. More patients died from progressive cardiac failure in the bed-rest group than in the armchair group, and possibly this was due to the greater incidence of pulmonary œdema in the bed-rest patients; spread of infarction was also somewhat commoner in the bed-rest group. Accordingly the part armchair treatment plays in the avoidance of late embolism cannot be assessed. Nevertheless Helander's results do suggest that we may have gone too far in treating patients with cardiac infarcts with strict bed rest and no activity of any sort. Some textbooks mention no alternative to such a regime. On the other hand, some cardiologists, such as Morgan Jones,[3] recommend a programme of progressive relaxation of rest after the first week; "the days of rest flat in bed—rigidly immobile, being fed, and being uncomfortably balanced on bedpans—are, if not gone, at least, I hope, numbered," he says. There is growing support for much earlier activity, and perhaps earlier discharge from hospital, especially if outpatient anticoagulant control can be arranged.

CLINICAL FEATURES OF PORENCEPHALY

THE term porencephaly was used by Herschl [4] in 1859 to describe circumscribed cystic defects of the cerebral hemispheres, arising during fœtal development. The word has passed through some semantic vicissitudes, at times being used loosely to cover any condition in which large cerebral cysts formed; but it has generally retained the connotation of a congenital condition, or one that develops very early in infancy. Three possible causes have been suggested—a true developmental defect (an abiotrophy), occlusion of a major cerebral vessel with

1. Levine, S., Lown, B. *J. Amer. med. Ass.* 1952, **148**, 1365.
2. Helander, S. *Acta med. scand.* 1958, **162**, 351.
3. Jones, A. M. *Brit. med. J.* 1955, ii, 1613.
4. Herschl, R. *Vrtljschr. prakt. Heilk.* 1859, **61**, 59.

consequent infarction and cyst formation, and meningo-encephalitis also causing vascular disturbance. It seems fairly certain that the first two sometimes cause the condition; the role of the third is less definite. In the first group rh-factor incompatibility probably plays a part in some cases.

The clinical features (usefully reviewed by Naef [5]) usually include local sensory and motor deficits, often with hemismallness of the affected limb, and sooner or later epilepsy. Some cases presenting as Little's disease have this defect. Minor degrees may remain undiagnosed until adult life: thus slight hemismallness and reduced motor facility may pass unnoticed until the onset of epilepsy in late adolescence or early adult life. Although treatment can only be symptomatic, diagnosis is important as the disorder is on the whole benign and relatively static. The diagnosis can usually be established by air encephalography, since the cystic defect almost invariably communicates with the ventricular system.

SALICYLATE INTOXICATION

THE abnormalities produced by salicylate poisoning are interesting but complex, and incompletely understood. Salicylate intoxication in 49 children, of whom 5 died and 8 had convulsions, has been described by Segar and Holliday.[6]

A transient first effect is respiratory alkalosis caused by direct stimulation of the midbrain respiratory centre and producing hyperventilation, fall in blood-carbon-dioxide, and a rise in blood-pH which may lead to tetany. The fall in carbon-dioxide tension results in decreased renal tubular bicarbonate reabsorption and increased loss of sodium and potassium as bicarbonate. These losses diminish the buffer capacities of extra- and intra-cellular fluids, which predisposes to rapid pH changes. Because of the acidity of salicylate and impaired renal function, metabolic acidosis soon follows; and this is characterised by ketonuria, low blood-carbon-dioxide and low pH. It is largely caused by interference with carbohydrate metabolism through disturbance of succinic dehydrogenase and α-ketoglutamic dehydrogenase, which are concerned in the tricarboxylic-acid cycle of Krebs. Increased protein and fat catabolism follows, and the subsequent ketosis is accelerated by depletion of hepatic and muscle glycogen due to starvation. Disturbed carbohydrate metabolism is also reflected in a raised blood-sugar level, possible additional factors being the promotion by salicylate of rapid carbohydrate absorption from the gut and an increase in adrenal corticosteroid output.

Water and salt changes are frequent. Dehydration is caused by hyperventilation, sweating, vomiting, diarrhœa, and pyrexia. The dehydration (measured by the blood-sodium) is hypertonic if water-loss has exceeded salt-loss. This state is accompanied by hyperpyrexia, convulsions, and raised cerebrospinal-fluid pressure. In the series of Segar and Holliday all the patients who died and some who recovered had hyperpyrexia. Although antipyretic by direct hypothalamic action, salicylate in toxic amounts increases metabolic rate and heat production; heat dissipation (by sweating and hyperventilation) is usually insufficient to keep the temperature down.

Benedict's test for reducing substances in the urine is positive in the presence not only of glucose but also of glycine and glycouronic-acid conjugates of salicylate and increased ascorbic-acid output—all of which may be found in salicylate intoxication. The ferric-chloride test will show salicylate in the urine. Hyperglycæmia, glycosuria, thirst, dehydration, hyperventilation, acetonuria, and metabolic acidosis may lead to a mistaken diagnosis of diabetic mellitus.

Rational therapy depends on the clinical and metabolic state. Alkali given in the alkalotic stage can produce fatal tetany. The main measures consist in cooling for hyperthermia; administration of fluids for dehydration, lactate for metabolic acidosis, potassium if the patient is potassium-depleted, glucose for starvation and ketosis, and vitamins; and avoidance of salt if the patient is hypernatræmic.

5. Naef, R. W. *Arch. Neurol. Psychiat.* 1958, **80**, 133.
6. Segar, W. E., Holliday, M. A. *New Engl. J. Med.* 1958, **259**, 1191.

ANTIBIOTICS FOR FARM ANIMALS

YOUNG animals generally gain weight faster when their food is enriched with small quantities of penicillin or tetracycline. The farmer does not raise animals for fun, and any technique which assists in the conversion of food to meat has obvious advantages. There have been, of course, some objections to such a deviation from a "normal" diet, but experience suggests that they do not amount to much. The minute traces of antibiotic left in the meat are almost entirely destroyed by cooking. Many calves fed with tetracycline have been found to harbour strains of *Escherichia coli* resistant to this antibiotic.[1] It was feared that this might lead to epidemics of "scours" which defied treatment; but such epidemics do not seem to have developed. Diets containing tetracycline are in fact used widely and without obviously disastrous results so far.

The reason for the accelerated maturity produced by antibiotics is still uncertain. The most convincing explanation is that it is, partly at any rate, due to a consequent reduction in the numbers of *Clostridium welchii* in the animal's bowel [2] (though why this organism, a normal inhabitant of the bowel of man and almost every domestic animal, should be inimical to growth is not easy to understand). As might be expected, pigs fed with tetracycline harbour fewer clostridia than those which have not had this supplement; but among some batches of them over 50% harbour strains which are resistant to tetracycline [3]; and such resistant strains are frequently passed from the sow to the piglets. Since strains of *Cl. welchii* resistant to tetracycline are found in a few pigs which have never had an antibiotic supplement, their predominance is due, no doubt, to selection. If the virtue of feeding tetracycline lies in the suppression of the clostridial flora of the bowel, it will be interesting to see if the benefit continues. It has been observed that feeding antibiotics is less effective in some herds than in others; possibly this variation is due to the development of antibiotic resistance.

With the awful warning of the staphylococcus before us, we should be wary of any thoughtless use of antibiotics. Nevertheless even if every *Cl. welchii* in every pig were resistant to tetracycline there would be little cause for alarm. For unknown reasons no strain resistant to penicillin has been found in pigs, and, if we can believe the advertisements, other antibiotics are available.

1. Smith, H. W., Crabb, W. E. *Vet. Rec.*, 1957, **69**, 24.
2. Lev, M., Briggs, C. A. E., Coates, M. E. *Nature, Lond.* 1956, **178**, 1125.
3. Smith, H. W. *J. Path. Bact.* 1959, **77**, 79.

THE annual meeting of the British Medical Associationis to be held jointly with the Canadian Medical Association in Edinburgh on July 18-24. The annual representative meeting of the B.M.A. will be held on July 16-20.

Special Articles

"NORMAL MIDWIFERY" *

T. B. FITZGERALD
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CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST, ASHTON UNDER LYNE GENERAL HOSPITAL

THE ideal obstetric service would deliver infants comfortably and conveniently, without avoidable morbidity or mortality for mother or child. The present services fall short of this ideal, as is shown, for example, by analyses of maternal deaths [1] and neonatal death and illness.[2] Though some of their defects cannot be remedied until we have new maternity hospitals and departments, some are due neither to deficiencies of equipment and accommodation nor to lack of skilled people. The failure lies in our use of our resources—partly through rigidity of administration and partly through the clash of interests in a tripartite service.

ESSENTIALS

If we are to deploy obstetric resources correctly, the first necessity is the early recognition of all abnormal cases—i.e., all those mothers in whom significant complications are present or may be anticipated. This, of course, is not as easy as it sounds, and opinions may differ on what is normal and what is not. But analysis of our experience in this hospital group has had some instructive results.

At our two maternity homes, delivery is undertaken by general practitioners; but the women are seen by a consultant obstetrician when they "book in" and again at the 36th week. By common consent, only "normal" cases are accepted for these homes; so any abnormal case which the family doctor recognises will be sent to the hospital clinic instead. Nevertheless, of 308 applicants for booking at one of the homes in 1957, 42 (13%) were regarded by the consultant as abnormal; and of the 183 applicants at the other home in two months in 1957 26 (14%) were redirected to hospital. The reasons are illustrated by the following 26 consecutive cases:

Primigravida, aged 35.
" " 36.
" " 32, 3 weeks overdue.
" " 34, with infertility.
" " 30, with toxæmia.
Aged 36, 6 years trying for a baby.
Aged 36, no living child, previous stillbirths.
Age and infertility.
Ten years' infertility.
History of retained placenta (2 cases).
" " postpartum hæmorrhage.
Transverse lie.
Breech presentation in primipara.
" " and toxæmia (BP 170/95).
Toxæmia of pregnancy.
" " " (B.P. 170/90).
" " " (B.P. 160/85).
" " " (B.P. 160/95).
Mitral stenosis (4 cases).
Chorea (2 cases).
Vaginal septum.

The arrangement whereby a consultant screens the women who are to be delivered at the maternity homes was introduced in 1951 with the consent of the general practitioners of the area. Its efficacy is evident from the table, which shows that in one of the homes the perinatal mortality afterwards fell from 32·4 per 1000 to 12·7.

RESULTS BEFORE AND AFTER INTRODUCTION OF SCREENING BY CONSULTANT

—	Before (1946–49)	After (1952–54)
Livebirths:		
Primiparæ	555	429
Multiparæ	523	594
Total	1078	1023
Stillbirths	17 (15·7 per 1000)	7 (6·7 per 1000)
Neonatal deaths	18 (16·7 per 1000)	6 (5·8 per 1000)
Perinatal deaths	35 (32·4 per 1000)	13 (12·7 per 1000)
Forceps deliveries	46	40
Puerperal pyrexia	59	34
Premature babies	29	18
Premature neonatal deaths	11	2
Breech deliveries	38	5
Breech mortality	7	1
Twin deliveries	16 babies	4 babies
Twin mortality	4	0
Consultant calls	9	18

In the six years 1952–57, during which the consultant clinics have been fully operational, there have been 3414 deliveries in the two maternity homes with a stillbirth-rate of 7·0 per 1000 deliveries, a neonatal death-rate of 1·8 and a perinatal death-rate of 8·7.

In a survey of 4277 domiciliary and maternity-home deliveries in south-west England the perinatal mortality was 33·9 per 1000—a figure which corresponds closely with that obtained in our maternity home before the consultant clinic was started. Similarly, in a division of our hospital zone in 1949–56 the stillbirth-rate for 6371 domiciliary deliveries was 16·3 per 1000, compared with 7·0 in the maternity home.

The saying "No case is normal until it is over" underlines the other aphorism "The price of safety is eternal vigilance". In the "normal" case, as previously defined, a trouble-free delivery and puerperium is probable but by no means certain. Examination of 3719 consecutive deliveries in the two maternity homes shows the following complications not foreseen by the consultant either when the patient booked or at his second examination at the 36th week.

There were 16 postpartum hæmorrhages necessitating transfusion (4·5 per 1000).

61 women were transferred to hospital during labour (16·4 per 1000).

In 27 cases consultant assistance was requested in labour mostly for difficult forceps deliveries. Under domiciliary conditions these would be added to the hospital transfers. The incidence of significant complications in labour would then rise to 23·6 per 1000 deliveries.

After delivery there were 52 maternal pyrexias of notifiable degree (14 per 1000) and 59 baby infections (15·8). There were no maternal deaths, and no baby deaths from sepsis.

With this information about the behaviour of the "normal" case, one can consider the best milieu for the care of these mothers.

PLACE OF DELIVERY

In the controversy about home or hospital confinement all that really matters is What is best for the mother and child?

The mother's house has both advantages and disadvantages:

Advantages.—The family circle is not disrupted. The mother retains her properly unique position in her immediate surroundings. There is less risk of cross-infection. Most homes are more comfortable than most hospitals.

Disadvantages.—If there are any unforeseen complications (e.g., postpartum haemorrhage, asphyxia of the baby) the home

* The facts and opinions set out in this paper were presented to the Cranbrook Committee in a personal memorandum.

1. Ministry of Health: Report on Confidential Enquiries into Maternal Deaths in England and Wales, 1952–54. H.M. Stationery Office, 1957.
2. Ministry of Health: Report on Neonatal Mortality and Morbidity. H.M. Stationery Office, 1949.

is not the best place for treatment. Family life may be seriously disrupted by the conduct of labour and delivery, especially if this is prolonged. The home may be overcrowded and there may not be enough domestic help.

Similarly the hospital has contrasting features:

Advantages.—If there is any serious complication, the hospital is safer. It may be a place of greater comfort and convenience for the actual labour.

Disadvantages.—There is a much increased risk of cross-infection, particularly of the baby. After delivery, the hospital is less comfortable than the home. The mother loses her unique position. Moreover, maternity hospitals are usually overcrowded, at least intermittently.

The general-practitioner maternity home occupies an intermediate position in that it is usually more "homey" than the hospital but possesses more safety factors than the mother's house. On the other hand, it is not so well staffed and equipped as the hospital and less comfortable than most homes.

THE OBSTETRIC TEAM

In obstetrics, the family doctor, the midwife, and the consultant should cooperate as members of a team; and the care of every pregnant woman should be the function of the team, whatever the precise duties of each member may be. In different circumstances a predominant share may be taken by one or other of the partners, but action in isolation should be a thing of the past.

I believe that the kind of partnership achieved in our maternity homes should be applied throughout domiciliary practice, though it will need various modifications to meet different needs in various localities. It works as follows in our area:

1. All cases are first seen by the general practitioner. Any which he identifies as abnormal are directed to the hospital.

2. All "normal" cases are screened by the consultant at a clinic in the maternity home where they have those routine tests which are better performed in a centralised manner—e.g., the routine blood tests.

3. In these maternity-home clinics, the matron of the home meets the patients, supervises their documentation, and assists at their examination, so that she too is well acquainted with them.

4. Thereafter the antenatal care of the patient is entirely in the hands of her own doctor—unless he refers her for consultation—until the 36th week.

5. At the 36th week, she is again seen by the consultant who has a chance to detect any complications which have developed since the initial booking—e.g., toxæmia, abnormal presentations, and disproportion.

6. She is not seen again by the consultant except at her doctor's specific request. He supervises her antenatal care, while the conduct of labour and delivery largely devolves on the midwife, though the doctor is on call and may take a larger part in this when he wishes to do so. (In 1956, of 424 deliveries at one maternity home, 400 were carried out by the midwife, though in many cases the family doctor was present.) The consultant, too, is on call should the doctor need his help.

CONCLUSIONS

Place of Confinement and Puerperium

Better selection of "normal" cases would improve the results of confinement in the patient's home. But, because there will always be an appreciable number of unpredictable complications, it is wiser to conduct most deliveries in hospitals or well-equipped maternity homes.

It is in the puerperium that the hospital environment is most unfavourable; and the best place for the normal puerperium is the mother's home. Such an arrangement is practicable provided the artificial barrier between home and hospital midwifery is removed. The major obstacle—the division of midwives into two organisations—is easily removable, given the will to remove it. This is proved by hospitals such as St. Mary's, Manchester, whose district is run by midwives centred on the hospital.

I would like to see the normal mother and baby discharged home 48 hours after delivery, and then nursed as though the district were a dispersed lying-in ward. (Recent work has shown that a high proportion of babies are not colonised by hospital bacteria until after the 3rd day.) The sister in charge would make her rounds by car with her pupils—accompanied by a hospital resident doctor for cases under the consultant. She would also look after cases which were under the charge of their family doctor, working with him in their care.

This reduction of the period of stay in hospital would release beds in sufficient numbers to take all who need them, without increasing the present allocations.

The Obstetric Team

The care of all cases should devolve on a team in which the midwife, general practitioner, and consultant are partners.

The *consultant* should see all mothers, though only twice if the pregnancy is "normal". All abnormal cases should be his special responsibility, though here, as elsewhere, the midwife has her considerable range of responsibility and authority.

The *family doctor* would realise his special duty in the supervision of the "normal" cases; for in these, too, constant vigilance is necessary. He would then have a proper place in the use of hospital wards, maternity homes, and other facilities, which, together with immediate specialist support, would be constantly "at his elbow". Probably the number of cases for which he would be responsible would increase with enlargement of his experience.

The unification of the *midwife* service would also have beneficial side-effects in that she would rotate through work in the labour theatres, the hospital lying-in wards, and the district "lying-in ward", so maintaining her interest. The argument that constant liaison with doctors might be detrimental to the status of the midwife is not borne out by experience. Hospital midwives work with their hospital doctors in a team, and they certainly do not think that this leads to loss of "face" with their patients.

The Patient's View

Most working-class mothers would welcome an early return home. Apart from the natural desire to get back to its physical and emotional comforts, a long stay away from other young children is one of their main anxieties. In the many cases where the husband has to stay off work so that there shall be someone in the house with the children, the mother's early return also prevents a serious loss of money. By this arrangement, the Home Help Service, which in most areas is unable to meet the real demand, could be used to better advantage.

I should like to make a very sincere acknowledgment of the patience, tolerance, and good work of the general practitioners and midwives concerned, since this is clearly the basis of the results achieved.

Points of View

DYNAMICS OF AMERICAN MEDICINE

Lord TAYLOR
M.D. Lond.

THE United States of America is the most dynamic society yet made by man—a land where all things are possible and most are probable. We in these islands can count ourselves lucky that we are now bound to America by many strong links of friendship.

Whereas rivalry between enemies is often harmful because it prevents their seeing each other's merits, rivalry between friends is a spur to achievement and adds a spice to life. So it is right for us to insist that in some respects we are still ahead of the Americans. We may think, for example, that the ordinary people of Britain get a better deal from our National Health Service than the ordinary people get in America. We may think we suffer less from social neuroses. We may think that there is a lot to be said for taking things calmly, for pausing to reflect and to look before leaping, or even for just pausing. But in the advancement of medical practice and research, we have definitely fallen behind them.

We shall do well, therefore, to give thought to the forces behind American medical achievement, and I for my part have learnt much from a new book [1] by Dr. Leonard G. Rowntree, formerly of Johns Hopkins, the Mayo Foundation, and Philadelphia.

By any standards Dr. Rowntree is himself a great man. He has done pioneer work on water intoxication, Addison's disease, blood-volume, arsenical diuretics, idiopathic fever, renal-function tests, and more besides. In three different centres he has built up departments of medicine, each with a strong research slant. And he played a big part in organising the United States army medical service during the war. Now in his mid-70s, he has sat down to tell us all about it. But though he writes without false modesty about his own achievements, he is far more interested in others than in himself. So he has made his autobiography a biographical history of 20th-century medicine. "Here", he says, "you are supposed to see through my eyes a revealing panorama of medicine in the Twentieth Century"; and it certainly is revealing—at least so far as the United States and Canada are concerned. (For Dr. Rowntree started life as a Canadian, in London, Ontario, and did not become an American citizen till he joined the U.S. Forces in the first world war.)

Such a book could hardly have been written by a retired English consultant; for it has a splendid lack of reticence:

"Dr. Lotus Coffman, President of the University of Minnesota, consulted me professionally on many occasions. He was literally astounded one day when I showed him his record. He had consulted me for various functional illnesses on seven occasions and always in the month of May. I assured him there was no organic trouble, that by May of each year he had completely exhausted his supply of energy. He did on one occasion have a calculus in Stensen's duct. After this was removed, I prescribed six months' silence. So on doctor's orders he turned down innumerable invitations to talk at breakfasts, luncheons, dinners and evening gatherings. He wrote me afterwards this was the best prescription he ever had and the happiest six months in his entire career."

We in this country are amazed to hear official descriptions over the radio of Mr. Eisenhower's colon. But the Americans are frankly interested in what goes on inside them, just as were our ancestors in the 17th and 18th centuries, when stones were the fashion and lithotomy a topic of polite conversation. Nor can it do any of us any harm to learn the truth about Dr. Lotus Coffman. Rather does it serve to drive home some simple lessons in good clinical medicine. Dr. Rowntree tells dozens of stories like this, some ending happily, some in disaster. Thus he describes the death of Dr. Henry Plummer, perhaps the greatest figure at the Mayo Clinic:

"While in his garden, he developed a form of cerebellar paralysis. He called his wife, predicted his own almost immediate demise and died exactly as predicted. Autopsy established the correctness of his diagnosis."

This is real clinical medicine, without a trace of humbug.

Dr. Rowntree now applies his capacity for honest clinical description to the great figures of American medicine and their work. His account of Banting and Best, Macleod and Collip—the truth set out exactly as he has seen it and learnt it—knocks the official Banting biography hollow.

This clinical truthfulness is perhaps the first secret of American medical success. Everyone has got to stand up to criticism, to have his techniques and conclusions examined and tested. There is here no room for our besetting sin—medical pomposity. When I revisit London teaching hospitals, I am always impressed by their achievements but just a little depressed by their tendency to satisfaction. A few doses of current medical history in Rowntree style would be a powerful corrective.

With the lack of reticence goes a freedom from cynicism, malice, and uncharitableness. In this book I have not found a single unkind remark. There are plenty of judgments on men and achievements—sometimes critical, sometimes (as we should think) overenthusiastic. But no one mentioned could feel seriously hurt, and many will be delighted to find their contributions remembered and seriously described. Too often, I think, we forget that praise, when earned, brings out the best in people. Cynicism and carping about the work and achievements of others damage both donor and recipient. This is the one thing we ought to be reticent about, like Dr. Rowntree.

Three places where modern American medicine has been forged are the Johns Hopkins Hospital, the Mayo Clinic, and the Rockefeller Institute. Now, of course, their influence has spread far and wide; but it was at these three places that the pattern was set. Just how much American medicine owes to Osler emerges as we follow his influence with Dr. Rowntree. "He was, in my opinion, the greatest doctor the new world has produced." Yet precisely because he was so truly of the New World he was a comparative failure at Oxford. Osler dared to be openly enthusiastic, naïve, uncynical, and in consequence uncritical. Yet how lucky for the world that he was as he was:

"The Rockefeller Institute for Medical Research owes its origin to Frederick T. Gates, a Baptist pastor who became one of John D. Rockefeller's philanthropic advisors. The Reverend Gates, having read Osler's *Principles and Practice of Medicine* from cover to cover, during his summer vacation, was astounded that, in Osler's opinion, only four or five diseases were actually

1. Amid Masters of Twentieth Century Medicine. By L. G. ROWNTREE. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 87*s*. 6*d*.

subject to medical cure! On returning in the fall, he sat down and wrote a memorandum revealing this appalling situation to John D. Rockefeller, Sr."

Welch of Johns Hopkins was called in, and later Simon Flexner was selected as first director. So, in due course, the Institute made possible the work of Carrel, Dakin, Van Slyke, Landsteiner, Wiener, and many more.

Osler said that the master-word in medicine was Work. Of course this is true of all human achievement. But work alone is not enough. It needs stimulation, assistance, and the right milieu for the single-mindedness which all the great American doctors seem to show. They press on regardless, and, because apparently they see the issues in very simple terms, they get wonderful results. There must be dash and pep and adventure to give life to research. There must be money. And there must be movement. One bad thing about our present medical organisation is that all of us, in hospitals and outside them, are far too closely confined to the locality in which we take our first major steps.

Just how much surgery and the world owes to the Mayo Clinic I must leave Dr. Rowntree to tell. Surgery and the world, however, owe the Mayo Clinic to a most beneficent tornado which struck Rochester, Minnesota, at 6.36 P.M. on Aug. 21, 1883.

" In the chaos old Doctor Mayo and the Sisters of St. Francis were called to take charge. The net result was that Mother Alfred asked Dr. Mayo to build a hospital at Rochester. He agreed to be its chief of staff, provided every doctor in Rochester was allowed to join. But only two besides the Mayo family would come in. The busiest practitioner in the town said old Dr. Mayo had no business sense, that the Mayos knew nothing about making money, and that any and all who joined them would face starvation! So began the greatest surgical enterprise of all time."

Here are Will Mayo's instructions to Rowntree on taking over the chair of graduate medicine and chief of the medical service in the Mayo Foundation:

"(1) We want a medical service comparable to our surgical service. You will have a free hand, but you alone will be held responsible.

"(2) Go anywhere and get anyone you want to assist you. But do not pay more than $15,000 a year without consulting Dr. Charlie or me.

"(3) See no patient is ever overcharged. For doctors and clergymen and their families there will be no charge. For school teachers the charges will always be minimal."

" Dr. Will's way of doing business was simple and direct. He wired me from Denver, Colorado, ' Will the Olmsted Hotel suffice until your clinic is ready ?' I wired back that it would. The same day came his reply, ' Bought it; start to convert it tomorrow.' "

O for decisions like this in our universities, hospitals, and research institutes! We waste our good men's time committing platitudes to paper for committees and sub-committees. We stifle their energy and initiative by forcing them to move only at the speed of the slowest in the group. We equate democracy with rule by the largest and most representative committee and with rigid financial control. The wonder is that we achieve as much as we do.

I have been singularly fortunate in being associated with two bodies with clear objectives and small powerful committees—the Nuffield Provincial Hospitals Trust and a New Town Development Corporation. The achievements of both have been phenomenal. The lessons I have learnt have been these:

Keep your committees small. Forbid subcommittees.

Pick those who have to do the job with care and courage. Then trust them to get on with the job, with a minimum of interference.

Give them the tools they need—of which the most important is money.

Expect them to make mistakes; this is when they will need your support most.

But I find I am writing like Dr. Rowntree. Let me end, then, with a few of his precepts:

Medicine must remain militantly aggressive towards all unconquered disease; only so can additional diseases be defeated.

Define your objectives in life and live so as to attain them.

Shake off regrets for the past, the fears for tomorrow, and start to live happily today.

Cultivate courtesy at home and abroad, especially at home.

Cultivate tastes that are attainable, available, and satisfying.

Learn to live for others—to give rather than to seek.

Have and express opinions, but avoid useless and provoking arguments.

Try to make life one of interest, activities, and zest.

Here are some of the things that make American medicine tick.

Medicine and the Law

Sequel to Extraction of Teeth

ON Oct. 24, 1954, a woman of 38 had ten teeth removed by her dentist. Afterwards she suffered from trismus and swelling of her cheek accompanied by intense pain.

The dentist treated her by irrigating her mouth; but, as her condition had not improved by Nov. 5, he sent her to her doctor with a note in which he mentioned that one root and half of another had been left in the jaw. The doctor diagnosed a dental abscess spreading up into the parotid gland and gave her penicillin injections, a mouthwash, and a kaolin preparation for external use. As there was no apparent response to the penicillin after four days, he gave larger doses of penicillin, together with some streptomycin. He assured the dentist, who was becoming anxious about the patient's lack of response to treatment, that the abscess was coming to a head. The doctor thought that the condition had improved and reduced the injections, but on Nov. 29 he found that her condition had again deteriorated, that there was a swelling inside her jaw, and almost complete trismus. He suspected osteomyelitis and arranged for her to go to hospital.

A series of operations were eventually performed and part of the condyle of the ascending ramus of the mandible was removed. The plaintiff claimed damages against the dentist and the doctor, alleging professional negligence. Both denied the allegations.

Mr. Justice McNair said that the plaintiff had endured great pain and suffering and had changed from a fit woman into a frail and chronically sick person. She had suffered a surgical disaster which could not have been anticipated on the ordinary extraction of teeth. No criticism had been made as to the way in which the extractions were performed, but she had alleged that X-ray films should have been taken of her mouth and that she had not been sent to hospital until too late. The main dispute was whether her symptoms were such that prudent practitioners in their respective spheres should have appreciated that her

condition was worse than would be accounted for by an ordinary dental abscess and was associated with osteomyelitis of the jaw. After careful consideration he accepted the doctor's account of her symptoms. Notwithstanding the evidence of professional witnesses that it would have been in accordance with prudent dental practice to take X-rays, he was satisfied that the taking of X-rays by the dentist would not have revealed anything of which he was not already aware. Having accepted the doctor's findings that there was not complete trismus and no abnormal temperature or pulse, his Lordship was not satisfied that the symptoms which he observed should have led him as a prudent practitioner to suspect osteomyelitis earlier than he did. He had therefore reached the conclusion that none of the charges had been made out. Had he reached the conclusion that the doctor had been negligent in his treatment he would have had to decide how far the dentist would have been entitled to rely on the views of the doctor as the plaintiff's medical adviser. As at present advised, he considered that a dentist was entitled to rely on the doctor's opinion as to the response of the patient to treatment unless it was clearly inconsistent with the facts observed by the dentist. The plaintiff's claim failed against both the dentist and the doctor.

Tanswell *v.* Nelson and Another—*Queen's Bench Division* (McNair, J.) Feb. 11, 1959. Counsel and solicitors: Campbell Lloyd-Davies (Alan Edmunds & Phillips); Brian Gibbens (Le Brasseur & Oakley); Geoffrey Howe (Le Brasseur & Oakley).

E. M. WELLWOOD
Barrister-at-Law.

Dialogues of Today

COMMITTEES

SOCRATES: Where have you been all day, Eryximachus? For a long time we have been discussing what is good and what is evil in medicine, and we have been waiting for you to come and enlighten us.

ERYXIMACHUS: I have been at a committee, Socrates, pursuing the same object as you, for I have been trying to persuade others to do what is good and avoid what is evil in medicine.

SOCRATES: Tell me, Eryximachus, what a committee is; for I am always glad to learn about any method of achieving such a desirable object.

ERYXIMACHUS: A committee, Socrates, is a democratic institution which enables decisions to be made by the collective wisdom of a group of people instead of by one man, which would be tyranny.

SOCRATES: I suppose, if one man makes a decision, many people will disagree with it; but, if the decision is made by a committee, all, accepting democratic institutions, will agree with it?

APOLLODORUS: By no means, Socrates. More people will disagree with the decisions of a committee than with those of a tyrant. Because few people wish to become tyrants, they do not take much interest in the decisions of tyrants, unless they themselves suffer hardship as a result; but every man is sure that he could decide a matter better than the members of a committee, even though he may know nothing about the reasons why they took their decision. So it is a democratic principle that all committees should arouse much disagreement.

SOCRATES: Tell me, Eryximachus, how a committee is appointed.

ERYXIMACHUS: Usually, Socrates, it is chosen by a larger group of people.

SOCRATES: And I suppose that if those who choose a committee are wise men they are likely to choose wise men to represent them, but if they are foolish they will not be wise enough to make such a choice, but will choose foolish men like themselves?

ERYXIMACHUS: Yes, Socrates, that is the representative principle.

SOCRATES: And when a decision has to be made about a course of action is there one wise course of action or many?

APOLLODORUS: Usually one, Socrates.

SOCRATES: And are many foolish actions possible?

APOLLODORUS: That is so, Socrates.

SOCRATES: And when a committee reaches a wise decision it will be approved by the wise men and disapproved by the foolish?

APOLLODORUS: Yes, indeed, Socrates.

SOCRATES: And if it reaches a foolish decision will that be approved by the foolish and disapproved by the wise?

APOLLODORUS: It will be disapproved by the wise, Socrates, but only some of the foolish will approve of it; for, as you have said, there are many alternative kinds of folly and some of the foolish will prefer their own kind to that chosen by the committee.

SOCRATES: Which is commoner, Apollodorus, wisdom or folly?

APOLLODORUS: Folly, Socrates.

SOCRATES: It would seem then that democracy must make it difficult to choose a wise committee, and if a committee reaches a wise decision it is likely to meet with more disapproval than approval.

APOLLODORUS: So it would seem in principle, Socrates, and experience bears that out.

SOCRATES: And if, as you say, wise men are rare and foolish men common, the larger a committee the more likely it will be to include foolish men.

APOLLODORUS: Yes, Socrates.

SOCRATES: So a small committee will be more likely to reach a wise decision than a large one.

APOLLODORUS: That is so.

SOCRATES: Besides being wise and foolish, are some men also more active than others?

APOLLODORUS: Yes, Socrates.

SOCRATES: So that there are more active and less active wise men, and more active and less active foolish men?

APOLLODORUS: Yes.

SOCRATES: And if a man is foolish is it better that he should be active or inactive?

APOLLODORUS: An inactive fool will do less harm, Socrates, than an active one.

SOCRATES: And if a man is wise is it better that he should be active or inactive?

APOLLODORUS: That depends upon circumstances, for a wise man will consider whether activity or inactivity is the better course in any situation.

SOCRATES: You said, Apollodorus, that the smaller the committee the less likely it will be to include foolish men. Does it not follow that a committee of one man is likely to be the wisest?

APOLLODORUS: Yes, Socrates, if a wise man could be relied upon always to be wise, that would be the best arrangement; but no man is always wise.

SOCRATES: Then would not the best committee be a small one in which the decisions are taken by the wisest man and the rest are wise enough to remain inactive?

APOLLODORUS: That, Socrates, would combine the best features of democracy and tyranny.

In England Now

A Running Commentary by Peripatetic Correspondents

WE could go to South Africa by air or by sea. The magic baits in the travel agents' windows dangled fascinating contrasts through the winter gloom of London. Should we choose speed and stability in the skies or lazing and dipping the horizon in the lee of a deckhouse? Should we chalk four straight vapour trails across the blue calm of the stratosphere or churn a creamy wake through a wide arc around Madeira? And what about our semicircular canals? The little paper bag in the airline's hospitality kit may glorify reflex speed and short duration, but how much more leisurely are the generous receptacles of the shipping company. And when we eat again, shall we snatch caviar and champagne from a plastic tray on our laps or, shall we contemplate sauntering down to white tables and the fragrance of the grill? Gracious living has become a selling-point. The transportation moguls are battling for our minds.

In the end we chose the sea, for a whisper has reached us that every Thursday afternoon at four o'clock a dream ship glides away from the piers of planned economy and the N.H.S.-drenched shores of Southampton Water. Towards professional freedom and the sun, salt water and the trade winds, Capricorn and careless rapture. We are promised long weeks of relaxation, all in, all found, and more to come. The lures were being drifted before our eyes. A swimming-pool on board, games by day, dancing and films by night, hot and cold in our cabin, a laundry, and constant ice-cream. But we were still wavering when the shipping company played their trump card of gracious living: they pointed to the words in the brochure—*an underworked doctor on board.*

We can hardly wait to meet this curiosity. Ten-and-a-half years have blurred our memory for atavistic forms. Yet somehow we feel strangely excited to be witnessing the first signs of a change in contemporary thought. Medicine must really be sailing out of the doldrums when astute advertisers have come to classify us with laundries and icecream as essentials for gracious living, offering unhurried consultation as a coveted luxury for the discerning traveller, personal treatment as a selling-point for good will. Perhaps this year of grace will see the turn of the tide.

* * *

"Doctor, I can't sleep for it." She rubbed both ears vigorously. "As soon as I lays me head on the pillow it starts and goes on all night." I examined her. "It never disturbs you during the day?" I asked. "No, never at all in the day, it's just when I lay down to rest and then it goes on and on; I haven't slept for a week."

"Let's have a look at your ears," I said. Sure enough they were both loaded with wax, so I syringed them and in the end both meatases looked as clean and shining as new pins. "Is that better?" "Yes, yes. I think so," she replied dubiously, and off she went—cured, I hoped.

She was back the next day looking more tired and haggard than ever. "No sleep?" I asked. "No sleep," she replied grimly. I gave her a prescription for some sleeping tablets. "These will give you a good night's rest," I said, hopefully. She departed. Her manner implied that they had better.

Not many days later she was back again. This time I added tranquillisers, but to no avail. I felt that greater minds than mine had better take over. An appointment with the psychiatrist was made and there was a longer interval this time before I saw her again.

Into the consulting-room she trotted. This time a changed woman: gone was the sleepless look, gone all signs of anxiety. Well, I thought, she would make a good advertisement for some drug. I made a mental note to use my psychiatric colleague more often.

"Well, you do look better," I exclaimed. "Yes, indeed," she answered tartly, not at all in the appreciative tone I thought we all deserved. "There's been no more rattling—not since they mended the window—I'm sleeping well now, but that specialist you sent me to, he wants me to go in voluntary. I thought I'd better come and see you first—just to see what you thinks."

* * *

I don't think he is going to prove satisfactory after all. When he first came he seemed conscientious and keen. He went about his examinations with zest, reaching those bold certain diagnoses that are not reached again until the pundit stage. Investigations were done punctiliously, and the atmosphere on the ward was good.

Last week I made a quick trip to town to buy a card for St. Valentine's Day. As I entered the shop I saw him standing there. He had already a vast stack of cards in one arm and was rapidly adding to them with the other. He solemnly got envelopes for the lot and departed, so engrossed with his task that he did not notice me. I bought a card—all the best ones had gone—and also left. I imagined he must be the hospital valentine representative, but a little doubt niggled at the back of my mind.

I moved on to the post office. There he was again, sitting at one of the tables the pile of cards before him. He sat rubbing out the prices, putting on the addresses, enveloping the cards, then stamping them. If he wasn't careful he was going to be late for my round. I dealt swiftly with my card and left.

On the rounds now when sister has to be addressed I tend to read second meanings into his words and looks. When she hasn't got to be addressed, and I am talking, and he is looking intelligently out of the window, I think perhaps he is gazing a little too fixedly away from her. I hope he was the hospital representative—I hope they did elect him, otherwise——. I wonder if he did send sister one—there were so many cards, he could hardly have missed her—still, a lot of practical jokes go on on these occasions—yet, he is such a serious chap. To think I was left with such a poor card to send to sister myself. I don't think he is quite the type I want on my ward at all.

* * *

HEART-CRIES FROM A CHILDREN'S HOSPITAL

Oh LorD

Please, Please, Please could you make my foot better quikly, because I"m Shor, Shor, Shor, neally every boddy would like me home, Aspeshaly for christmas and Christmas-eav.

Please could you try and get me and all the rest out of Hospital coase no-one likes it much. So remember my foot oh LorD.

ARE-MEN.

Oh LorD

Please try to stop me from wetting the bed at night-time. I can have a good report sometimes. So Now theres two thing too try and do but ckonsontrate on the foot and build upwoulds in-stead of starting at the top.

ARE-MEN.

* * *

As a medical librarian who has actually seen *students* blush when we exchange familiarities, I sympathise with the peripatetic correspondent of Feb. 7. I can add many other distractions "from both sides of the counter"; for most of us share this brotherhood of exasperation, being at the mercy of modernity often too lavishly applied. Those large windows letting in blazing sun and roaring traffic, and gales of wind, which cause the painfully acquired lists of references to soar to the ceiling; the whining vacuum cleaner; and those devilish three Ts—the Typewriter, the Telephone, and the 'Tannoy'. Oh, for the musty silence of the old "Lit. and Phil." where the lady staff—God bless them—were not allowed into the smoke-room. The term "library", however, has changed its connotation, and librarians have undergone metamorphosis. The old "custos"—keeper, preserver—has gone, it seems. The ideal is now an alert, steely-eyed individual, his finger on the pulse of "the Literature", his three "Ts" always to hand, and references instead of quotations reeling off his tongue. Maybe doctors like it better that way—at least the steely-eyed ones. For the "scholasticus" seems to have gone the way of the "custos", and the almighty "Reference" to have replaced the "tag".

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From a student's case-note.—"Two years ago she was operated on for bunyans". Possibly contracted on a pilgrim's progress.

Letters to the Editor

TROPICAL PRACTICE

SIR,—I am proud and happy to be quoted with approval by Dr. John McFie (Jan. 10), by Dr. John Wright,[1] and in your editorial.[2] The articles from Nigeria and from Uganda give practical illustrations of what is indeed taking place and what needs to be done.

As Dr. McFie points out, there are many areas where vital statistics do not exist, but surveys and observations have proved that there is a high morbidity and mortality among the children. In some places only 70–50% of those born alive survive to maturity, compared with about 97% in the United Kingdom.

It is fairly simple to ascertain the fact of death and the approximate age at death. It is more difficult to give the cause or causes with certainty. Even in a modern children's hospital postmortem examinations are necessary. "Almost one half of the certifications were not correct as judged by the final pathological diagnosis."[3] Waterlow and Wills[4] suggest that the 1–4 death-rate may be regarded as an index of malnutrition. There are two objections to their figures. In the first place they compare the 1–4 deaths with the numbers of live births. This gives no valid comparision with other countries, because if there is a high infant mortality there are fewer children at risk in the 1–4 age-group. It is quite true that in the underdeveloped areas there are large numbers of children who are malnourished when they die. But without careful investigation it is impossible to say whether this is a primary malnutrition due to poor diets or a malnutrition secondary to diarrhœa, worms, and other diseases. Many of these children suffer from multiple disorders. The nutritionist may only recognise the malnutrition. The malariologist will blame the malaria. The tuberculosis specialist will blame the tuberculosis. Where figures exist they show that diarrhœal diseases are the most important lethal condition (they may be taken for granted by the parents and may not even be mentioned in the history). How much they are the cause, and how much the effect, of malnutrition is not always easy to say. More pædiatricians are badly needed.

This is why too much trust cannot be placed simply in the distribution of food supplements. Free milk does not ensure beds or medical treatment for the sick; it does not automatically abolish the dyspepsia, enteritis, worms, skin diseases, tuberculosis. It does not necessarily increase parental responsibility and understanding. In some places where large quantities of milk have been given out it has been said to overwhelm any other work in the clinics. While I absolutely agree that malnourished children should be fed, it would be reassuring to know that more money and attention was being given to the training of doctors, nurses, and medical assistants in clinical nutrition and in pædiatrics, and that more and better hospital and home care was being made available for children. Soup kitchens did not entirely solve the problem of the 19th century. Milk kitchens will not solve those of the 20th.

That education at high places needs attention is all too true.

The Uganda Government states quite seriously: "It is felt that maternal and child-welfare work can be adequately covered by the Senior Medical Officer in charge of Health Education." If the Government were appointing a surgeon or a trypanosomiasis specialist, it would probably expect some experience or training in these subjects from the candidates.

The Under-secretary of State for the Colonies states that "it is only in the more sophisticated areas that patients are willing to use child-welfare clinics as distinct from sick-children's clinics".

Sir, I would doubt if there is much virtue in establishing "child welfare" in the absence of treatment for children who are sick and dying. Africans, like any other normal parents, feel that treatment of the sick is a high priority. Once they have confidence in the treatment, it is not difficult to get them to listen to advice on prevention.[5]

Unless we train our doctors, nurses, and medical assistants in child care (which includes clinical nutrition), and unless we realise the importance of continuity of personnel, of observation, and of understanding, we cannot expect good results.

"Child welfare", as distinct from sick-children's clinics, are a result of historical accidents in the United Kingdom and elsewhere. The fact that they come under separate authorities is irrational and wasteful. There is no necessity for us to impose this poor pattern on other countries. There are other and better patterns which would be more effective and more economical.

Dr. McFie wearily ended his letter[6] with: "The problem is how to ensure that the directors have the right outlook"; and this, he feels, is beyond the scope of education. There is much evidence that Dr. McFie is correct—but surely we should go on trying. Many of the present "directors" of all descriptions have had little or no opportunity of learning about clinical nutrition, and even less about pædiatrics or the organisation of maternal and child-health work in developing countries. Unless and until there has been some attempt to provide education (postgraduate and undergraduate) in these subjects, it is not fair to give way to cynicism and abandon hope. The medical profession as a whole is to blame.

In spite of the high child-mortality, there is at the same time increasing fear of the dangers of overpopulation. We are prepared to spend vast sums on disease eradication while fertility remains high. With sophistication the numbers of neglected children are increasing in Uganda, the Caribbean, and other areas. It is when people have confidence in the survival of their children and pride in their future, and only then, that they are willing to accept the disciplines of family planning. It is in the countries with a high standard of child health that there is voluntary limitation of the size of the family.

London, S.W.12. CICELY D. WILLIAMS.

MENTAL HEALTH BILL

SIR,—The purpose of all legislation on mental illness in this country has been to cover the needs of care, protection, and treatment of the mentally afflicted. Having been devised by lawyers, it fails to take full account of the requirements of the doctor.

The laws of 1890 were obsessed with the need to protect society and to safeguard the rights of the "lunatic". These laws were not concerned with "treatment", because in those days no medical remedies were available. The main function of the sick man's professional attendants was custodial.

Progress was made in 1930 when the Mental Treatment Act recognised the mentally afflicted as sick persons who should be induced to accept the therapeutic relationships normally existing between any doctor and any patient. The need to afford the doctor legal protection whilst he was treating the patient was for the first time recognised. The inducement consisted in granting the patient safeguards against unnecessary detention; the protection to the doctor was the 72-hour clause

1. *Lancet*, 1958, ii, 453.
2. *ibid.* p. 448.
3. Emery, J. L., Irvine, K. A. *Brit. med. J.* 1958, ii, 1510.
4. *J. trop. Pediat.* 1958, **3**, 167.
5. Williams, C. D. *ibid.* 1956, **2**, 141.
6. *Lancet*, 1958, ii, 582.

governing discharge. In this newly recognised therapeutic relationship the patient "volunteered" to accept treatment which in theory some doctor (unnamed) was expected to give.

The new Bill, as it now stands, is not as preoccupied as were its two predecessors with problems of care and protection—possibly because the success of recently introduced medical remedies has made our legislators less concerned with the dangers inherent in untreated or partially treated mental illness. The fact that patients might not have been given these remedies by doctors lacking legal protection has also perhaps been overlooked.

The Bill not only provides inadequate legal protection for the doctor but adds considerably to his professional hazards by bringing him into a potentially insincere relationship with professional colleagues, with anxious, resentful, and necessarily often ignorant relatives, and also with members of review tribunals, who are likely to have only a few of his workaday responsibilities. Such impediments to his sense of professional security could occasionally make the doctor reluctant to expose himself to expensive litigation or damaging publicity. Worse still, the working psychiatrist is to lose the support, guidance, and advice of H.M. Board of Control, to whose dispassionate leadership we all owe so much.

Can we be certain that the precept of "community care" is a wise exchange for those medicolegal principles which have so adequately protected the doctor-patient relationship as to make it possible (paradoxically enough) for the present legislation to be conceived? Far too few people (outside the profession) appear to recognise that both the doctor and the patient require the protection of the Law, one as much as the other. The present Bill, in my opinion, offers the working doctor insufficient protection, and may thus deprive the patient of the best protection he can ever receive—namely, effective treatment.

Apparently the working psychiatrist will be able to transfer some of his responsibilities to a "community care" permissively operated by the local health authority; after which the local authority, acting *in loco parentis* (or in lieu of the nearest relative!), will be able to return the difficult, occasionally dangerous, and insufficiently treated patient to the mental hospital. Such a process is what I believe physicists in their lighter moments call a feed-back mechanism.

May I express the hope, on behalf of many future sick people who are neither "psychopathic" nor "severely subnormal", that our legislators will remember to afford us working psychiatrists that measure of medicolegal protection which is our due and without which we may have increasing technical difficulty in embarking on treatment, and some reluctance to do so. Without active and effective treatment the whole scheme might produce psychiatric vagabondage. It could, indeed, collapse as a dangerous fiasco.

Hill End Hospital,
St. Albans. HAROLD PALMER.

SIR,—I feel that the Royal Commission rightly placed great faith in the training of patients in hospital and in the community care which will be provided for them later. The time required to rehabilitate a mentally subnormal patient depends, I suggest, on four factors:

1. The selection of the patients for return to the community and their choice of vocational training.

2. A training programme of wide scope, and variety, including trial on daily licence or in pre-licence hostels, and social training in all the usual aspects of living in the outside world.

3. By keeping patients continually in touch with the community throughout their training in hospital, through social activities, village or local interest, through the help of the church, youth clubs, voluntary organisations, parents' associations, &c.

4. By the understanding and sympathetic community care and supervision while on their period of trial in the community.

By these means a patient is equipped, as far as he can possibly be, when he takes the last step on the staircase of rehabilitation within the community; and his ability to fit into society or not should be easily shown in six months' time.

Bromham Hospital, Bedford. GLADYS ANYAN DANBY.

SIR,—The response to my letter of Jan. 17 has been encouraging yet disturbing. It is encouraging in that, of 17 medical superintendents who have written to me, 13 express active support for my criticisms, compared with 4 who support the Bill's recommendations—albeit in 1 case halfheartedly! (For those who prefer to view the matter in terms of hospital beds rather than the medical superintendents in charge of them, the respective figures are 17,483 and 4049.) I have also had letters of support from three local health authorities. The response is disturbing in that it seems to suggest that those who drafted the Bill were influenced by persons with an idealistic and unrealistic view of the problem, supported by only a minority of those with practical experience.

I share Dr. Pilkington's opinion (Jan. 31) that our inpatient and outpatient psychotherapeutic service to the mentally subnormal should be expanded. In Stoke Park Hospital I think we had already accepted "the challenge to adopt a more enlightened and progressive attitude", and long before the Mental Health Bill was published we had instituted weekly case conferences, psychotherapeutic interviews, and outpatient clinics aimed at community care. However, the additional experience so gained has not yet persuaded us that the subnormal patient can be treated as though he were not in fact subnormal, nor that attendance of discharged patients at outpatient clinics is readily accepted on an informal basis.

I believe that Dr. Craft's figures (Jan. 31) support rather than refute the contention of Dr. Nelson (Jan. 24) and myself that automatic discharge of patients at an arbitrarily fixed age, or after an equally arbitrary period of licence, produces an unsatisfactorily high proportion of failures (unless Dr. Craft regards his figure of 24% as satisfactory). We feel that this proportion could be considerably reduced if these arbitrary age and licence limits were removed and adjusted to the therapeutic requirements of each individual patient.

Bristol. W. A. HEATON-WARD.

SIR,—The Mental Health Bill is not only liberalising for the patient but liberating for the doctor. The responsible medical officer is no longer he who superintends but he who treats. The Bill makes it clear that there is no place for the medical superintendent; all that is now required is vigilance that some statutory regulation is not used to bring back feudal power to any administrative functionary.

Administration necessarily involves repeated consultation with the patients, nurses, and doctors. For medical advice, the hospital management committee will have to

turn to the medical advisory committee; and, given courage, sufficient authority will now attach to the chairman and secretary of that body. The chairman will be untrammelled by any need to justify economy: it will be his job to ask for as much money as possible—e.g., for increase of nursing and medical staff. He will not be in the position of an apologist, putting across schemes for niggardly economies.

Dr. Bickford (Feb. 7) makes the point that it is necessary to have somebody to deal with the day-by-day circumstances of the patient. Last July the Minister of Health hinted that to cover such needs he would propose the appointment of a consultant to be in charge of general rehabilitation and welfare services.

But I share with Dr. Bickford some anxiety about the future association of the psychiatric services with the local authority.

I hope the regional hospital boards will maintain the autonomy of any psychiatrist who has dealings with the local authority. Association and collaboration certainly—but no psychiatrist of the regional hospital board should be *under* the administrative control of the local authority.

The problems to be thrashed out between hospital psychiatrists and local authorities centre mainly on the ready provision of part III accommodation, of accessible homes for the aged, and training centres for the subnormal, and a smooth transition of 17–18-year-olds from one official welfare body to another. No youth should be left high and dry because on one birthday he passes outside the reach of the children's officer and on another birthday he passes from the responsibility of a youth officer dealing with training.

To one psychiatrist at least the Mental Health Bill comes as a fulfilment.

Chester. I. FROST.

SIR,—I should like to express the modern view as opposed to the archaic, or time-worn, view of Dr. Bickford and his followers.

The physician-superintendents of mental hospitals are consultant psychiatrists trained for a highly specialised branch of medicine; and how they can say that, for instance, the ordering of furniture is every bit as essential as psychotherapy has long been a puzzle to me.

All of us in medicine must finally realise that, working with us, are lay administrators of the highest order who have the interests of the sick at heart, and who, as a result of their training, are very competent. The old-fashioned friction between medical staff and administrative staff must cease. There is no sense in non-cooperation and non-toleration. It is quite erroneous, also, to imagine that other non-doctors, such as psychiatric social workers, psychologists, and almoners, have any less interest than we have in the general welfare of patients. The existence of such intelligent people, with sincere high motivation, is a blessing; and I would rather work with such colleagues than with a psychiatrist who merely sits behind a desk worrying about " food, clothing, lighting, furniture ".

What surgeon, or what physician, is unduly beset by worry about such things as furniture? (As to food, they can prescribe any diet for any patient!) What doctors in other departments of medicine *are* worried about is the patient—essentially and only the patient—and how to get him returned to a good state of health. It is high time that superintendents of mental hospitals got down to the work they are best qualified for. The possession of a D.P.M. certainly does not confer any particular administrative brilliance on its possessor—far from it.

I may add that there is now no particular need for senior psychiatrists (and their families) to live within the precincts of a mental hospital; specialists in other branches of medicine, who are far more often concerned with life and death than we are, do not do so. There is much trumpet-blowing in high places about the open-door policy in psychiatric units—of more freedom for the patient. But what about allowing the staff out now and again!

Since psychiatric patients can now be admitted to general hospitals, is it not more sensible that we should live at some point equidistant from all the hospitals?

Finally, I can assure the " old brigade " that, when the general hospitals do begin to admit our patients, the non-medical and much-maligned administrators will continue to look after them as they have looked after our medical, surgical, obstetric, and other patients in the past, to their everlasting credit.

DEPUTY PHYSICIAN SUPERINTENDENT.

SIR,—The increased responsibility which, under the new Bill, will fall on the totality of senior medical staff in mental hospitals will be used, I hope, not only for a reorganisation but also for a reorientation. In addition to the chairman of the medical staff committee, which will have to come from their midst, every mental hospital with six or more doctors should, I believe, have a director of studies. His task would be to give lectures to the junior doctors and to make them acquainted with methods and trends in psychiatry in this and other countries. These directors could meet on a regional basis and consider lines of joint research. They could prepare the ground for further developments when, in happier days, research departments will be attached to mental hospitals in greater numbers than at present, when one can count them on one's fingers. For psychiatric progress in this country a legal framework—I am surely not the first to say this—is not enough. The part to be played by university departments comes under a different heading.

Reading. STEPHEN KRAUSS.

SIR,—Although one has much sympathy with Dr. Bickford (Feb. 7) in his reaction to proposed reform in the mental hospitals it is paradoxical that he quotes transfer of mental hospitals from local authorities to the Ministry of Health as the greatest single cause for the present advancement of psychiatry.

A similar comment applies to the non-teaching general hospitals: and even more so because opinion at the time when the Health Service came in was sufficiently advanced to allow for abandonment of the vertical hierarchical hospital structure, with authority passed through a medical superintendent, in favour of horizontal structuring, in which each individual consultant has equal status and takes full responsibility.

By retaining the present authority structure in the mental hospital we should be preserving the worst feature of the former local-authority system.

The mental hospitals now have the opportunity of working out new methods of internal organisation, with clinical consultants achieving the same status as their colleagues elsewhere. When this happens, the integration of psychological with other branches of medicine will proceed much more effectively; and there will be a good prospect of the principle being established—throughout *all* hospitals—that the primary aim of administration should be to follow and support the clinician in his relationships with patients.

It cannot be easy for a medical superintendent, trained and experienced in using the present authority structure, to accept that surrender of authority to individual clinical

consultants may be a better arrangement; but I suggest that, once established, this will remove much present frustration, and at the same time tap very substantial sources of new clinical initiative.

London, W.1. R. W. CROCKET.

DIRECTOR-GENERAL, N.H.S.?

SIR,—Surely this appointment [1] is long overdue and one that should be reflected right down the line to hospital level. The appointment of a medical director (C.O.) for each large hospital or group of small hospitals would do away with one of the main troubles in the service committees. Recently in the *Journal of the American Medical Association* it was stated that "a camel looked like an animal which had been assembled by a committee".

East Malling, Kent. J. H. C. WALKER.

HEPARIN CLEARING AND PLATELETS

SIR,—Dr. Mitchell (Jan. 24) reports that a platelet extract inhibits the ability of lipoprotein lipase—heparin clearing factor—to clear lipæmic plasma. The evidence does not allow him to decide whether the platelet extract is acting on the substrate—the chylomicra—or on the enzyme. Mr. Rothnie (Feb. 7) has suggested that since platelets are known to have an anti-heparin effect they must somehow be acting on the enzyme, which is known to contain heparin.

I have recently been studying the effect of heparin on some clotting factors, and inevitably lipoprotein lipase activity appeared during in-vivo studies. The close analogy between these two systems prompts me to mention work being prepared for publication elsewhere.

If a carefully adjusted quantity of heparin is added to platelet-poor plasma from a patient with Christmas disease, the heparin combines (probably almost exclusively) with the β-lipoproteins. If Christmas factor (C.F.) is added to this heparin-plasma mixture, it can be shown that heparin becomes attached to the C.F. and that the C.F. is inactivated. If platelets or protamine sulphate are added to this inactive heparin-C.F. complex it can be shown that the C.F. activity reappears. Thus heparin apparently has a greater affinity for platelets or protamine sulphate than for C.F. and a greater affinity for C.F. than for β-lipoprotein. An enzyme (C.F.) is inactivated by heparin, and the further addition of platelet protein enables enzymic activity again to become manifest.

Lipoprotein lipase is presumably made by the combination of an inactive precursor with heparin, and the enzyme can be inactivated by protamine sulphate. I would like to suggest that since it has been shown that platelet protein inactivates both free heparin and heparin in the heparin-C.F. complex, it becomes more probable that platelets can similarly inactivate the heparin moiety of the lipoprotein lipase, thereby inactivating the enzyme.

It has been shown that *intact* platelets do not shorten a 'Stypven' clotting-time, while platelet fragments, by virtue of their platelet lipoid (cephalin), greatly accelerate this test. Similarly it has recently been shown that intact platelets in native plasma from blood centrifuged slowly in silicone-treated glassware do not inactivate heparin. Thus in two ways the intact platelet cell surface behaves very differently from platelet fragments. The importance of Mitchell's observation to an in-vivo situation would therefore seem to depend on the amount of fragmented platelet debris in the circulation.

Portsmouth and Isle of Wight Pathological Service, The Central Laboratory, Milton Road, Portsmouth, Hampshire. J. R. O'BRIEN.

1. See *Lancet*, Feb. 14, 1959, p. 357.

THE "FLOPPY" INFANT

SIR,—In your editorial (Feb. 7) on the "floppy" infant, you mention as one of the causes a congenital muscular dystrophy, which is progressive, although less rapidly so than the spinal muscular atrophy of Werdnig and Hoffmann, and you cite papers by Batten and myself as describing examples of this condition. This progressive infantile muscular dystrophy does exist,[1] but it is not the disorder described in my papers of 1940 [2] and 1949.[3] The point which I tried to bring out in these papers was that the picture of amyotonia congenita in infancy might gradually change into that of a non-progressive myopathy, and it was for this reason that the condition was described as benign congenital myopathy. I have little doubt that this is the condition which Walton has more recently called benign congenital hypotonia. The main feature of this condition is the tendency for the child to improve gradually, unlike the downhill course of the Werdnig-Hoffmann disease. Whether the condition should in fact be called a myopathy is certainly debatable, and, as was stated in a previous editorial,[4] this problem may be solved by the more refined methods of muscle biopsy and histology described by Woolf and Tall.[5]

St. Bartholomew's Hospital, London, E.C.1. J. W. ALDREN TURNER.

AN IMMUNOLOGICAL PUZZLE

SIR,—Immunologists show a deplorable inability to express themselves clearly. They are guilty of (1) not knowing the definition of the terms they use, and (2) stretching the meaning of words so as to accommodate new ideas in cases where the coining of a new word is indicated. Although immunologists find it adequate to communicate with each other by the improper use of words, I feel a revision of their jargon is most urgently called for. There are three points that I wish to put forward:

(1) Looseness of language has resulted in most people equating "immunologic" with "antibody-reacting" and vice versa.

However, not all antibody-reacting systems are necessarily immunologic. Antibodies may have no real relationship to immunity. Antibody production should be regarded simply as a physiological response of the body to antigenic substances, regardless of their eventual usefulness to the body. Though antibodies undoubtedly play an important part in immunity (as in infectious diseases), they are not necessarily the only instrument of immunity.

Similarly, an immunological response should not be taken to mean exclusively an antibody response. It is not necessarily an antibody response but is a response which confers non-susceptibility or freedom from disease (recognising there are degrees of this).

It has been said, however, that certain immunological responses cause disease. If this is so, we arrive at the paradox of a process (i.e., the immunological response) which confers freedom from disease but at the same time causes disease! No immunological response by definition can cause disease. Only certain types of antibody response may result in disease, as in those which manifest as hypersensitivity reactions. Would it not therefore be better for immunology to ask future writers on this subject to bear this distinction in mind and to refrain from using the phrase "immunological response" when antibody response is meant?

(2) "Immunisation" is the process of conferring decreased susceptibility. However, it has often been used to indicate

1. Walton, J. N. *Lancet*, 1956, ii, 1023.
2. Turner, J. W. A. *Brain*, 1940, **63**, 163.
3. Turner, J. W. A. *ibid.* 1949, **72**, 25.
4. *Lancet*, 1957, i, 82.
5. Woolf, A. L., Tall, K. *Proc. R. Soc. Med.* 1955, **48**, 189.

merely the injection of a substance. Even where the injected substance is known to be antigenic, the use of the word "immunisation" would be illegitimate unless the injection is aimed at producing immunity—in which the corresponding antibodies may or may not play a part.

(3) "Auto-immunisation" is an unsatisfactory word for the same reasons. Firstly, most immunologists use it to mean "auto antibody production", but as pointed out earlier, antibody production is not equivalent to immunisation. "Auto-antibodisation" would be a better term though somewhat tongue-twisting. Secondly, the word immunisation implies freedom from disease, and this contradicts the implication of injury in "auto-immunisation" as used by some authors.

I sincerely hope my views will find sympathy with your readers, especially those interested in immunology.

London Hospital Medical College,
London, E.1. PETER FAN.

VALLERGAN

SIR,—The following experience with 'Vallergan Forte' (trimeprazine tartrate) may be of interest to anæsthetists.

A child, aged 4 years and weighing 37 lb., was to undergo adenoidectomy, and it was decided to use the syrup as a pre-operative sedative. The child was of a happy disposition and well adapted to hospital surroundings. One hour before operation he was given 6 ml. (36 mg.) of vallergan syrup (i.e., approximately 1 mg. per lb. body-weight). Ten minutes later he became violently excited and required the attention of two nurses to prevent his injuring himself. This behaviour lasted fifteen minutes, after which he settled down and slept, and was then given atropine gr. $^1/_{100}$. The operation was uneventful, and the amount of inhalation anæsthetic required was negligible. No postoperative sedative was necessary.

London, W.2. F. WIDLAKE.

THE FIBRE COMPOSITION OF HOSPITAL DUST

SIR,—I should like to explain why the results obtained from the tests described by Mr. Pressley [1] were not in line with expectations.

Dust is either not charged electrically at all, charged positively, or charged negatively according to the molecular make-up of the individual dust particles. Consequently the dust with the opposite charge to that of 'Terylene' would all be collected, that with the same charge would be repelled, while a fair amount with no charge would be collected. From the results of these tests, we can infer that the protein particles have a similar charge to the terylene filter, and any other deductions are useless. Similarly, plastic insulating materials have differing charges.

If this were not so, by making up solutions of the right electrostatic charge and by atomising them into the air, dust could be made into heavy blobs which would fall to the ground, and the air could be completely freed of dust.

I would strongly advise anyone intending to carry out similar tests in this country to consult the Department of Scientific and Industrial Research regarding suitable filters for collecting the samples with no electrostatic characteristics at all.

I was interested in the references by Dr. Schwabacher and her colleagues [2] to impregnating oils.

A common recipe is a 20% solution of "white oil". In my opinion, however, such impregnations, including resinous impregnations, will prove useless because of the difficulty involved in removing all the impregnant in the laundry process.

This company obtained satisfactory bacteriological results, using staphylococcus and streptococcus, with resinous impregnated dusters incorporating a quaternary ammonium disinfectant. This work was not followed up.

Anti-Dust Services Ltd.,
53a Stafford Street,
Dudley, Worcs. K. H. WATSON
Managing Director.

1. Pressley, T. A. *Lancet*, 1958, ii, 712.
2. Schwabacher, H., Salsbury, A. J., Fincham, W. J. *ibid.* p. 709.

CHILDREN IN HOSPITAL

SIR,—Your leader last week rightly welcomes the Platt Committee's mainly excellent report, and draws attention to its failure to mention the desirability of planning the concentration of children's hospital services in the largest children's hospitals or children's units which the density of population of any given area can support. This topic is one which the committee studiously avoid, perhaps because the Royal College of Physicians have so recently advocated this course, in a report with which the Minister has expressed agreement,[1] but perhaps also because their terms of reference, which relate to the *welfare* of children in hospital, specifically exclude "medical and nursing treatment". They do, however, venture rather unsuccessfully into this field in para. 34, where they say:

"There is no reason why our recommendations concerning the welfare of the child should not be adopted in small units just as in large ones. It is very difficult to lay down rules about the minimum size of children's units, but we believe it should be possible to run children's wards with as few as 8 to 10 beds."

Even if it were true that their recommendations as regards "welfare"—excluding medical and nursing treatment, and presumably education—could be adequately carried out in units of 8–10 beds, this would be of little more than academic interest. It is certainly not true of medical and nursing treatment or of education.

As Lord Crook implied,[2] the almost simultaneous publication of the Platt report and a Ministry circular accepting it in toto, a day or two before the Lords debate of Feb. 12, hardly seemed fortuitous, and I rather expected that para. 34 would crop up somehow in the debate. A noble lord's avid seizure [3] upon this—the only really ludicrous paragraph in an otherwise valuable report—is evidence of the lengths to which an apologist of the Government will go in trying to justify the effects of that failure of constructive leadership and planning in the Ministry to which both the Acton Society Trust report [4] and the Sixth Report of the Select Committee of Estimates of the House of Commons have drawn attention.

Lord Cohen of Birkenhead went on to explain the apparent flat contradiction between para. 34 of the Platt report and the general tenor of the College of Physicians report by disingenuously suggesting to their Lordships that the Royal College of Physicians was a pædiatric club and that their report was written specifically to protect the special preserves of pædiatricians, whereas the Platt report was written by public-spirited people actually interested in the welfare of sick children.

It is now 7 months since the Ministry proposed, as a solution to the pædiatric problems of this area, the total abolition of Queen Mary's Hospital for Children, and the dissemination of its 400 acute and long-stay patients around a number of unspecified smaller units. In this very densely populated area are 1000 beds allocated to children. 700 are at Queen Mary's and 300 are in the children's wards of a large number of hospitals. About 600 children occupy these 1000 beds. A further unknown number of children are in fever hospitals, and in beds allocated to adults.

No-one knows how many children are in adult beds. It is notable that, to obtain sample figures, the Platt Committee had to go, not to the Ministry of Health, but to the Nuffield Foundation's division for architectural studies. If this sample, which showed that 30% of the children were in adult beds, is

1. Hansard (House of Lords) Nov. 13, 1958.
2. *ibid.* Feb. 12, 1959 (col. 222).
3. *ibid.* (col. 201).
4. See *Lancet*, Feb. 14, 1959, p. 349.

representative, it would appear that the apparent 30% excess of children's beds throughout the country may be largely illusory!

The ill-found proposal to close or to emasculate Queen Mary's has in the last few months been opposed by public petition, by the local medical committees of Surrey and Croydon, by all local members of Parliament, by neighbouring local authorities, by the executive committee of the British Pædiatric Association, and by the Surrey Education Committee. It also flies in the face of all informed professional opinion, of the report of the Royal College of Physicians, and of your own oft-expressed editorial policy.

Every major recommendation of the Platt Committee is already standard practice at Queen Mary's, but many of these recommendations are impossible of fulfilment in smaller units. Our standards are in many respects higher than those called for by the Platt Committee. For example the visits home and to other places outside the hospital and the occasional visits of brothers and sisters which you call for in your editorial have been normal practice here for some time.

Is it too much to ask that the Minister of Health and some of his advisers should come 15 miles south to see for themselves this unique institution in which the Platt Committee recommendations were implemented before they were written, and which the Minister has proposed to throw overboard in favour of units in which such implementation can never be complete?

DAVID LAWSON
Physician-Superintendent and Consultant Pædiatrician.
Queen Mary's Hospital for Children, Carshalton, Surrey.

PROTECTIVE CAP FOR MOTORISTS

SIR,—Many of your readers will know that a soft protective cap for motorists has been designed by the British Hat and Allied Felt Makers Research Association, Droylsden, and is now available. The cap is light, comfortable, and of good appearance, and will absorb 60% of the violence of a 4000 lb. impact. I hope that all doctors, and especially those who treat accidents, will obtain one of these caps, and a second one for their front-seat passenger, and that this will be an occasion on which the whole profession can unite in setting a good example in preventive medicine.

ROBERT ROAF.
The Robert Jones & Agnes Hunt Orthopœdic Hospital, Oswestry.

COMA DUE TO MEPROBAMATE INTOXICATION

SIR,—Dr. Bedson (Feb. 7) describes a case in which the blood-pressure was considerably depressed in the absence of deep coma. Our experience may be of interest in this connection. We described three cases of hypotension in psychiatric inpatients receiving meprobamate in therapeutic amounts.[1] These patients did not develop coma or cutaneous vasodilatation but were pale and cold to touch—in two the blood-pressure fell to 90/50 mm. Hg. Individual variation in response to the drug appears to be important. In addition to the references cited by Dr. Bedson, Shane and Hirsch[2] described three patients in whom coma and a dangerous fall of blood-pressure followed suicidal attempts with large doses of meprobamate.

LINTON GRIMSHAW.
Department of Psychiatry, Royal Infirmary, Manchester, 13.

1. Scott, P. A. L., Grimshaw, L., Molony, H. M. P. *Lancet*, 1956, ii, 1158; *Arch. intern. Med.* 1957, **100**, 484.
2. Shane, A. M., Hirsch, S. *Canad. med. Ass. J.* 1956, **74**, 908.

A "CHEST SERVICE"

SIR,—Your leader of Feb. 7 contains much sense and some disordered thinking. It might be better to speak of a "chest-clinic service", for you are speaking of the service available at a chest clinic.

This organisation deals mainly with tuberculosis. Probably more than nine-tenths of the clinical work is in connection with the tuberculosis cases, and the nursing and administrative staff are largely employed to deal with the tuberculosis service. The non-tuberculous chest cases and the non-pulmonary tuberculous cases are a small group of interesting clinical material that prevents the average chest specialist from losing contact with the main body of medical practice and becoming submerged in the massive weight of pulmonary tuberculosis with its varied clinical, epidemiological, and social aspects.

For many years to come the chest-clinic service will deal with tuberculosis, mainly in its pulmonary form. But why break it up? Because our hospital outpatient departments give a relatively limited service to most patients, this is no argument for going backwards. The chest-clinic service is a prototype for the future—a method of organisation for dealing with a wide range of chronic diseases all of which have vast social implications.

Yes indeed, let us integrate with the general medical outpatient department when this department has been raised to a higher level of medical practice with full ancillary services not at present available to the general physicians. Who can say that present arrangements for the management of diabetes mellitus, dissemina.ed sclerosis, or rheumatoid arthritis are satisfactory?

Finally there is the general question of mental health, for which the new Bill seeks to offer the beginning of a solution. How much can be learned for the future organisation of the mental health service from the old tuberculosis service, now incorporated in the chest clinics as a slightly broadened service known to many as the chest-clinic service? Those who work in this service are proud of it, not because of past achievement alone—although this has been great—but because this service blazes a trail into the future which the main body of British medicine will one day acknowledge and follow.

P. W. ROE.
Watford.

SIR,—Your leading article adversely criticises chest-clinic work concerned with the diagnosis and care of patients suffering from non-tuberculous respiratory disorders. Although chest-clinic work is increasing, you apparently think that the service should be gradually dismantled as tuberculosis declines. I disagree with your conclusions, and think that they are based on false premises.

As a chest physician I am, of course, biased in favour of preserving my future professional prospects. There is, however, one important statement in the article from which most of the conclusions adverse to the chest service are drawn, and which is not supported by any evidence. You state that the crux of the problem is the diagnosis and care of patients with non-tuberculous respiratory disease. Without giving any supporting facts you then go on to say that "the majority of patients with these conditions are probably sent to the clinics for a chest X-ray to exclude tuberculosis and cancer, rather than to obtain a consultant's advice on treatment of chronic bronchitis or acute respiratory infection." If this were so, then in those areas where general X-ray facilities have so expanded that a full general-practitioner service is provided one would expect a corresponding decline in the numbers of new cases attending chest clinics. In this area, where there has been a considerable expansion of X-ray services at hospitals and outpatient clinics since 1948, the number of new cases, excluding tuberculosis and contacts, attending chest clinics rose from

1209 in 1948 to 2140 in 1957. If the majority of these cases were sent for X-ray exclusion, they could have been sent more easily to the hospital X-ray departments, which are already carrying out a considerable general-practitioner service.

In my opinion, therefore, the increased number of non-tuberculous referrals reflects the general practitioner's wish to have the specialist advice he receives from a chest clinic.

The Sanatorium, Rushden House, Rushden, Northants. O. E. FISHER.

SIR,—As a thoracic surgeon attending a number of chest clinics in North-West London I find your leading article of Feb. 7 somewhat disturbing.

The up-to-date chest clinic is doing very good work, as can be seen from the number of new patients with non-tuberculous conditions being sent for investigation. The present delay associated with medical outpatients does not appeal to doctors anxious to get early advice on a possible serious chest condition. The arrangement for X-ray facilities for general practitioners allows, in many cases, rapid diagnosis and prompt treatment of bronchial carcinoma. The interval between a doctor sending his patient to the chest clinic and lung resection can be as short as two weeks.

As the number of patients suffering from pulmonary tuberculosis diminishes, some modification in the staffing structure of a chest clinic may be possible, but I feel that the specialised unit should continue.

Clare Hall Hospital, South Mimms, Barnet. R. LAIRD.

PRESCRIPTION CHARGES

SIR,—I read with interest the article on the effect of increasing prescription charges by Dr. Martin and Miss Williams in *The Lancet* of Jan. 3.

It appears to me that everyone has the wrong idea about this 1*s.* prescription charge. It bears no relation whatever to the value of the drugs supplied (which may be anything from 6*d.* to several pounds) and certainly no relation to the value of the services given.

It is a pure token payment and should be kept as such. Each patient, in return for his National Health contribution, should receive whatever, in medical opinion, he needs in the way of advice, treatment, and medicine for the same token payment of 1*s.*; otherwise there is gross injustice.

A patient with, say, heart-disease or arthritis may receive expensive treatment in the form of X rays, cardiograms, radiant heat, physiotherapy, injections, &c.—all taking up a lot of the specialist's valuable time—and, because they do not need a variety of drugs (albeit those required may be very expensive), receive a month's supply for 1*s.* only.

On the other hand, it is often advisable for a patient with a skin complaint to visit his specialist weekly, because the treatment varies with the individual's reaction, tolerance, and progress. On each occasion he may be given five items, and charged 5*s.* each week. Yet his treatment has cost the hospital far less. The cost of his pot. permang. solutions, sulphur or calamine lotions, calcium mixtures, or phenobarbitone is infinitesimal, compared with phenylindianamine or prednisolone.

Surely this injustice could be remedied by the simple expedient of charging 1*s.* for one week's supply of drugs, whatever is needed. This would considerably reduce the drug bill since doctors would not be tempted to prescribe several months' supply at a time to save the patient's pocket. The number of shillings would probably average about the same as under the present unfair system.

London, W.C.1. K. HOBLING
Hospital Pharmacist.

STAPHYLOCOCCI IN HOSPITALS

SIR,—I have read with considerable interest the letters on this subject. Much has been said about dirty walls, and restrictive practices of unions, and now Dr. Avery Jones says, in his letter last week, "the root cause of dirty walls has been the lack of interval cleaning of wards and departments".

This statement, of course, is quite wrong. The root cause of dirty walls is the dust-laden atmosphere. Prevention is better than cure, it is said; and if this polluting of the atmosphere by discharges from factory and domestic chimneys, power stations, railway shunting-yards, gas-works &c., could be stopped there would be very little dirt to settle on the walls.

The question of whether walls should be cleaned by porters or painters seems to me to be sidetracking the real issue, which is surely how to control staphylococcal infections. I would suggest an immediate and intelligent appreciation of the recommendations made in the Cohen report must be the approach to the problem by medical, nursing, and all other hospital staff.

The report indicates that the effective application of the principles underlying the various measures which are recommended for the prevention of staphylococcal infection depends on their combination in a balanced scheme of control.

Central Middlesex Hospital, London, N.W.10. ARTHUR S. COLLINS
Hospital Secretary.

SIR,—I have been as interested in your correspondents' letters, and in particular those of Dr. Avery Jones and Mr. E. G. Young last week, as I was in the television programme which seems to have started the whole discussion.

I have just re-read the circular which was received in 1952 (H.M.C. [52] 123), and its ambiguity, like that of many that have followed it, has undoubted advantages as it enables administrators to apply their own interpretation.

Skilled labour need not necessarily imply members of the National Society of Painters. For many years the spring-cleaning of the wards of this hospital has been admirably carried out by a reputable firm of cleaners whose skill is beyond question. Unfortunately it has not been easy for firms of decorators to submit competitive tenders for the work, but the signs are that this will change and the members of the National Society of Painters will win back the work which, it is claimed, they alone are competent to do.

I am grateful to Dr. Avery Jones for jolting me into consciousness of a need for regular, not only spring, cleaning, by skilled labour of one trade or another.

Children's Hospital, Birmingham. N. R. WINWOOD
House Governor.

SIR,—May I reply factually to Mr. E. G. Young's letter last week?

The disputes to which he refers have arisen over the use of staff other than skilled painters for washing walls. I have gone carefully into this point, and the situation is that there is a national agreement for the use of skilled painters (H.M.C.[52]123): (*a*) for the cleaning of paintwork where the cleaning is to be immediately followed by repainting; and (*b*) when washing down has been decided on instead of repainting.

Hospitals are getting unnecessarily dirty because so little cleaning is done between major "spring-cleans". My contention is that for this work porters and cleaners may be used, and indeed a decision on this point was achieved by the Industrial Disputes Tribunal (Award 711, May 3, 1955). Unfortunately it is clear that the painters' unions have been doing all they possibly can to prevent cleaners and porters taking part in this essential interval cleaning.

The question of cleanliness of hospitals is too important to become merely a battle concerning trade-union principles. There is no doubt that maintenance grants have been cut to the bone by economy measures, but there is also no doubt that hospitals themselves can do much to improve the efficiency of their arrangements for cleaning. Much can be said for eliminating the present division of responsibility and for making a single department responsible for hospital cleaning.

Central Middlesex Hospital, London, N.W.10. F. AVERY JONES.

SIR,—Whoever cleans or does not clean the walls of hospitals, antibiotic-resistant staphylococci are already in them. Many hospitals now hold erythromycin and novobiocin as antibiotics to be used exclusively for severe staphylococcal cases, in the hope that this policy will delay the development of resistance to these two antibiotics; in your issue of Feb. 14, Dr. Goodier and Dr. Parry report on an investigation in which they found 97% and 98% of staphylococci still sensitive to erythromycin.

On another page an advertisement ("a happy goodbye to respiratory infections") claims that erythromycin (under a trade name which might conceal its identity from the casual reader) "kills outright the great majority of pathogens responsible for commonly occurring respiratory diseases", and describes this drug as the "antibiotic of choice in the complications of influenza". Erythromycin is not known to attack viruses, which are probably "the great majority of pathogens responsible for commonly occuring respiratory diseases". Further comment would be possible but is, I hope, unnecessary.

London School of Hygiene and Tropical Medicine, W.C.1. E. T. C. SPOONER.

SIR,—In his letter last week Dr. Keith Thompson mentions my name and refers to results of my investigation into the incidence and variety of bacterial contamination of operation wounds. This was apparently discussed at a recent conference at which I was not present. I must dissociate myself not only from his remarks but also from other comments made and any conclusions which may have been drawn, because the investigation is still in progress. In due course I hope to publish the results.

Birmingham Accident Hospital. S. SEVITT.

A NEW AGE SPECIALTY—NEOTESIATRICS

SIR,—According to an editorial in the *Journal of the American Medical Association* [1] the existing age specialties —pædiatrics and geriatrics—no longer suffice to cover the need of practical medicine in the United States, where a special clinic for teenagers has been in operation since 1952. This enterprise has had such success that several other American cities have started similar clinics.

They take patients of both sexes from 12 to 21, and have both men and women doctors, so that the patients can choose.[2] The best possible emotional contact with the patient is aimed at, which is important if the special psychic and social problems of the teenage patients are to be understood. The special difficulty of achieving contact with that age-group has hitherto been neglected alike by pædiatricians, physicians, and general practitioners, and the teenage clinics are said to serve a useful educational purpose for all these groups.

Searching for an appropriate name for this new specialty I attempted a direct translation of "teenage doctor", into Greek, but this was difficult to achieve. The Greek for "teen" is καιδεκαῖος, and the most fitting translation for "age" is νεότης which means "the young age". On this basis the term should be "kaidekatoneotesiatrics"; but this is too long, and perhaps "neotesiatrics", though a less precise translation, is better suited to practical use. If this specialty is to cross the Atlantic, we had better fit it into our system of Greek terminology for specialties before it arrives!

Svendborg County Hospital, Denmark. TORBEN K. WITH.

*** We may recall that Sir Heneage Ogilvie has already coined the word "ephebiatrics" for the medical care of men and women of 18–25 doing their National Service.[3]—ED. L.

DEATH OF A TESTICLE

SIR,—Mr. V. J. Downie, in his letter last week, writes: "Torsion is *never* followed by gangrene." The italics are his.

Quite certainly this statement is fallacious, for I possess colour photographs of three adolescent boys with dark brown or black gangrenous patches of the scrotum secondary to torsion of the testis misdiagnosed and treated as acute epididymo-orchitis. The colour photograph of one of these patients was for many years reproduced in former editions of *A Short Practice of Surgery*. In these examples, and in a number of others, the testis was found at operation to be jet-black and lifeless as a result of torsion of the spermatic cord or, somewhat less frequently, of torsion of the mesentery that joins the testis to the epididymis.

Sholden, Kent. HAMILTON BAILEY.

IS PEPTIC ULCER AN ENDOCRINE DISEASE?

SIR,—We wish to comment on two aspects of this problem.

Mr. W. M. Keynes (Feb. 7), discussing the Zollinger-Ellison syndrome, states that "there is no good evidence that removal of the pancreatic tumour alone will affect the gastric secretory function". A case (case 1) has been reported by Dragstedt and his colleagues [4] which suggests that it will. The patient had had repeated operations for duodenal ulceration and its complications. After three gastric resections, vagotomy, and resection of the body and tail of the pancreas he still had a gastrojejunocolic fistula, "5 to 20 clinical units of free acid in the morning fasting specimens and a moderate response in acidity to histamine stimulation". Resection of the head of the pancreas and the duodenum revealed "a non-insulin-producing islet-cell tumour arising in ectopic pancreatic tissue" and resulted in healing of the stomal ulcer and the fistula and in abolition of night acid secretion and response to histamine. It should be emphasised that no further gastric tissue was removed at this operation.

In your leading article (Jan. 17) you state that glucagon is still in the running as a link between non-insulin-secreting islet-cell tumours on the one hand and gastric hyperchlorhydria and peptic ulceration on the other. Our results in dogs with denervated (Heidenhain) gastric pouches indicate that glucagon is an inhibitor of the antral phase of gastric secretion. In doses of 0·1 and 1·0 mg. intravenously (in dogs of 6–8 kg.) it abolishes completely the response to stimulation with meat extract. This effect is not produced by the accompanying hyperglycæmia, for glucose intravenously does not cause it and, when insulin is given with the glucagon to prevent a rise in the blood-sugar, inhibition is still obtained. Glucagon also reduces the volume of the basal (unstimulated) secretion by about one-third. It does not affect the response to stimulation with histamine. We do not yet know what effect it has on

1. 1958, **168**, 288.
2. Gallagher, J. R. *Children*, 1954, **1**, 165; *Pediatrics*, 1957 **19**, 937.
3. Ogilvie, W. H. *Lancet*, 1954, ii. 395.
4. Oberhelman, H. A., Jr., Nelsen, T. S., Dragstedt, L. R. *A.M.A. Arch. Surg.* 1958, **77**, 402.

the secretion induced by vagal stimulation. These results will be reported in detail elsewhere.

We wish to thank Messrs. Eli Lilly & Co. Ltd., for supplies of Glucagon.

R. B. WELBOURN
S. D. CLARKE
D. W. NEILL.

Department of Surgery,
Queen's University, Belfast.

THE SHORTAGE OF MIDWIVES

SIR,—There are two very interesting articles in your issue of Feb. 7 on which I should like to comment.

The first is Professor Claye's on Obstetrics as a Discipline. On reading this really delightful lecture one has the impression that Professor Claye is truly a midwife at heart, and that he understands the value of continuity of care throughout pregnancy, labour, and the puerperium. But judging by his references to midwives, one cannot help thinking that he regards this as important only from the doctors' point of view. In fact, midwives hardly seem to be necessary at all, and one cannot help wondering if Professor Claye envisages in the future a maternity service entirely staffed by doctors, with the aid of "handy women" to wait on them. This would indeed be taking us back to the days of Tristram Shandy.

Professor Claye disagrees with the recommendation in the Ministry of Health report that hospital midwives should have time to talk to expectant mothers, and in domiciliary practice he thinks "comfort and advice should be given by the man who takes the responsibility for all the medical problems of the mother's life, not by the midwife who shortly after the baby's birth is no longer concerned with her". By all means let the doctor give comfort and advice, but why should not the midwife do the same? Many expectant mothers have small anxieties and problems which they feel are not enough to bother the doctor about, but which they do like to discuss with the midwife. It is certainly an advantage for the mother and baby if the doctor is close at hand during labour, ready to come to the aid of the midwife if necessary, and I would agree with everything Professor Claye says about this. But can he deny that it is the midwife who spends most time with the mother at this "most important event in the syndrome", and that it is not always possible for the doctor to be present at the birth of the baby? If the midwife has known the mother during pregnancy, she will have built up a personal relationship with her which will prove of great value to them both during the labour, whether the doctor is there or not.

Mr. Frank Stabler's article on the Shortage of Midwives is a timely one, and indeed it is something of an antidote to Professor Claye's remarks about midwives.

I would like to assure Mr. Stabler that the Royal College of Midwives does not believe that the present shortage of midwives in hospitals is entirely due to inadequate salaries and unsatisfactory conditions of service, though these are important. We know that some most unlikely hospitals are fully staffed, and that midwives stay in them for years, and usually it is because they feel they are doing a really worth-while job. Mr. Stabler's ideas about the architectural design of maternity hospitals are most interesting, and incidentally they are completely in line with one of the recommendations of the Ministry of Health for making the practice of midwifery in hospitals more attractive.

Mr. Stabler has emphasised the need to make the work of the midwife a satisfying whole, and his description of the "satisfied midwife" as one who is "not too senior to deal with bedpans, nor too junior to be regarded as anything but a friend and a highly skilled colleague by the doctor", surely contains a profound truth. If one could feel that the majority of obstetricians, including Professor Claye, also believed this, and were prepared to do all they could to make it a reality, it would be a tremendous encouragement to the midwifery profession, and would go a long way towards solving the problem of the shortage of midwives.

Royal College of Midwives,
15, Mansfield Street,
London, W.1.

AUDREY WOOD
General Secretary.

SIR,—I note that from several quarters has come the suggestion that hospital midwifery is less attractive because the midwife who delivers the baby seldom has the opportunity to continue the care of the mother until her discharge and so complete the job. The suggestion is made that matters should be arranged so that this should be possible. This appears to me to be "high thinking" of the most unpractical kind in an age of 44-hour weeks and "2-days-off-a-week-on-nights"; nor do I think it necessary from either the interest or morale point of view.

Surely we are moving away from the age of rigid individual responsibility in all places and circumstances and have replaced it with a spirit of corporate achievement in which satisfaction with the work of the team is the pride of the individual.

In this hospital we have found it better that midwives should work in their own departments, seeing that each develops a skill and aptitude for a particular job; but those in the labour-ward can and do keep in touch with the lying-in patients, and those in the wards know what is going on in the receiving-room. And they all relieve each other when the occasion arises.

And when it is all over, it is *our* mother and baby who go home; it is the hospital staff and not an individual who is thanked, and it is the hospital which is visited later. It is more than possible that each one of us would get less satisfaction if we had some "follow-through" routine by individuals; and the doctors might get little at all. I think we are happier because we are "all of one company".

Maternity Hospital,
Swindon.

GUY ROWORTH.

"ANOTHER PLACE"

SIR,—I cannot allow Mr. Denis Browne's article last week to pass entirely without comment, for it is without doubt the most depressing thing that I have read for many a long day. I wish I could persuade myself that it were either exaggerated or simply untrue, but to me it carries conviction in every line. The implications of it at this moment in the fortunes of our profession are unpleasant indeed, for if this is the sort of treatment that our present problems may hope to receive when they in turn come to be debated in "another place", our prospects are not very bright.

Hale, Cheshire. L. B. WEVILL.

END-TIDAL AIR SAMPLER

SIR,—Two methods of automatically sampling end-tidal air have recently been described.[1 2] Both methods require pressure-controlled electric relays. Automatic end-tidal sampling is probably most commonly required for the control of intermittent positive pressure respiration. For this purpose the very simple sampling arrangement we have described [3] may suffice. The device can be made up from parts already in the possession of most anæsthetic departments. Dr. J. F. Nunn has been kind enough to test our device with a rapid infra-red carbon-dioxide analyser. He reports that completely satisfactory end-tidal samples were delivered so long as the tidal volume was large enough to wash out the dead space of the one-way valve used. This, of course, would usually be the case.

The London Chest Hospital, E.2. L. H. CAPEL.
Guy's Hospital, London, S.E.1. D. C. HODGSON.

1. Nunn, J. F., Pincock, A. C. *Brit. J. Anæsth.* 1957, **29**, 98.
2. Smith, A. C., Schuster, E., Spalding, J. M. K. *Lancet*, Feb. 7, 1959, p. 277.
3. Capel, L. H., Hodgson, D. C. *ibid.* 1956, ii, 609.

TREATMENT OF A STROKE

SIR,—In this leading article (Feb. 7) you say:

"A chain of reactions is thought to lead to the production of a sufficient concentration of thrombin to convert fibrinogen to fibrin; but even the crudest simplification of the postulated reaction includes eight stages. Each stage has its inhibitors as well as its activators."

As far as my own knowledge goes the only established inhibitors in normal blood to intravascular thrombosis are the antithrombins, including the heparin system and the plasminogen-plasmin system responsible for clot lysis.

Lewisham Hospital,
London, S.E.13. PETER WOLF.

NEONATAL MYOPIC MOULDING

SIR,—I am trying to establish whether or not the impact of excessive glare on the eyes of the newborn infant is a factor in the increased incidence of acquired visual errors. In India at least, till about a generation ago, the mother and infant used to remain in darkened rooms for several days after delivery. Visual errors were not then encountered in such alarming proportions as now, when infants are exposed to broad daylight or high-powered fluorescent and incandescent light from the moment of birth. I believe that this early and excessive stimulation leads to a spasm of the internal and external muscles of the eyes, causing more myopic moulding, while the sclera is elastic. I should welcome any views on this contention.

Bombay. V. V. GUPTE.

CORTICOTROPHIN AND A-METHOPTERIN COMBINATION IN CUSHING'S SYNDROME DUE TO MALIGNANT ADRENAL CORTICAL TUMOUR

SIR,—In studies on the transport of chemotherapeutic agents to tumour cells, we noted [1] that a combination by diazotisation of A-methopterin and γ-globulins from hamsters previously immunised against mouse leukæmia 1210 by a heterologous graft was notably more effective in mice with this leukæmia than the simple addition of A-methopterin and immune γ-globulins.

We have treated two patients with adrenal cortical tumours and Cushing's syndrome with a combination by diazotisation of corticotrophin and A-methopterin, on the ground that the cells of these tumours can have a greater affinity for corticotrophin than all other cells of the body.

CASE 1.—The patient, aged 4 years, had had manifestations of Cushing's syndrome since February, 1958. The urinary hormone levels were considerably modified (see table). A big abdominal mass could be palpated.

Radiotherapy (3000 r) in combination with actinomycin D (1250 μg) did not decrease the size of the mass, but had some effect on the level of steroid hormones (see table). In the fifth to seventh weeks after cessation of X-ray therapy the patient received seven injections, each of corticotrophin 25 mg. and A-methopterin 2 mg. Following this, the size of the tumour, determined by palpation, decreased considerably and the urinary excretion of steroid hormones decreased greatly (see table).

On June 6, at operation, excision of the tumour was found to be impossible because of neoplastic infiltration around the vessels. Biopsy confirmed the diagnosis of malignant cortical tumour. The levels of A-methopterin (tested by the method of Zakrzewski and Nichol [2]) was 0·0076 mg. per g. of tumorous tissue and 0·00086 mg. per g. of muscle tissue. After the operation the patient received two injections weekly of corticotrophin 25 mg. and A-methopterin 2 mg. The general condition was good until the end of August. Then a humoral relapse ensued, despite increased doses of corticotrophin 50 mg. and A-methopterin 4 mg. every two days. The patient died on Nov. 21. Necropsy confirmed the diagnosis. The level of A-methopterin in tumour tissue was 0·012 mg. per g. and in muscle 0·00093 mg. per g. (corticotrophin 50 mg. combined with A-methopterin 4 mg. had been injected the day before death).

CASE 2.—A woman, aged 32, had typical Cushing's syndrome, which first manifested itself in 1955 in high blood-pressure. In 1956 a voluminous adrenal cortical tumour was excised, and histologically this was proved to be malignant. The patient's condition improved for a few months. In October, 1957, laparotomy revealed recurrence of the tumour, which appeared to be so extensive as not to be removable. A course of X-ray therapy (13,000 r) did not produce much change in the patient's condition. At the end of July the situation had deteriorated, with great obesity and a blood-pressure of 200/120–160/100 mm. Hg.; there was generalised œdema and troublesome dyspnœa related to pleural and lung metastases; the abdomen was distended and painful; and there was sustained fever. Urinary 17-ketosteroids were 160 mg. and 17-hydroxycorticoids 68·4 mg. per 24 hours. From July 28 onwards the patient received the corticotrophin/A-methopterin combination (corticotrophin 25 mg. and A-methopterin 2 mg. per ampoule) according to the following schedule: one ampoule on July 28, 2 ampoules daily from July 29 to Aug. 2, 3 ampoules daily from Aug. 3 to 7, 4 ampoules daily from Aug. 8 to 11, 5 ampoules daily from Aug. 12 to 15. This treatment brought about rapid improvement, shown by a decrease of the œdema and the disappearance of dyspnœa. On Aug. 26 the urinary 17-ketosteroids were 28·5 mg. and the 17-hydroxycorticoids 9·9 mg. per 24 hours. However, the patient died a little later in irreversible shock.

These two cases do not constitute absolute proof of the effectiveness of the combination used. Case 1 had been submitted to X-ray therapy a month before the treatment; and a delayed necrotic effect of radiotherapy could have taken place at the same time as the chemotherapeutic agents were given. Surgical exploration showed that the tumour had decreased in size but had not disappeared. In the second case the patient died despite the improvement induced by treatment. Necropsy could not be obtained, and there is no certain

1. Mathé, G., Tran Ba Loc, Bernard, J., C. *R. Acad. Sci. Paris*, 1958, **246**, 1626.

2. Zakrzewski, S. F., Nichol, C. A. *J. biol. Chem.* 1953, **205**, 361.

FINDINGS IN CASE 1

—	Feb. 7	Feb. 21	March 6*	March 9*	March 10*	Apr. 10–13	Apr. 13–14	May 12†	May 13†	May 31†	July 3†	July 25†	Sept. 8†	Sept. 29†
Urine vol. (ml./24 hr.)	300	..	275	184	138	745	570	630	630	760	900	910	..	1000
Creatinine (g./24 hr.)	0·31	1·08	0·29	0·23	0·12	0·14	0·16	0·25	0·15	0·17	0·18	0·15	..	0·30
Pregnandiol (mg./24 hr.)	0·7	..	..	..	..	..	..	..	..	..	..	..	..	..
Œstrone (μg./24 hr.)	5	..	..	..	..	5	10	5	5	..	..	..	..	..
17-ketosteroids (mg./24 hr.)	402	..	234	263	154	102	104	20	23·2	14·3	21	31	136	165
Dehydroepiandrosterone (mg./24 hr.)	340	..	..	..	..	30·8	26·3	..	..	14	18·9	..	..	..
17-hydroxycorticoids (mg./24 hr.)	14·4	32·5	10·3	7·6	5·6	2·4	3·8	2·6	4·3	5·2	10·8	6·3	..	17·2

* Radiotherapy plus actinomycin D.
† Corticotrophin plus A-methopterin administered between May 12 and Nov. 20.
The patient underwent operation on June 6 and died on Nov. 21.

explanation for the death. It can be assumed, however, that this was associated with acute adrenal cortical insufficiency or some other complication connected with the tumour. These results suggest a peculiar effect of the chemotherapeutic combination used. This effect showed itself in a decrease, in both cases, of the urinary corticoids. The considerable difference between the levels of A-methopterin in the tumour and in muscle of the first case supports the suggested mechanism of action—selective transport of the drug by corticotrophin to tumour cells.

Case 1 was treated in the unit of Prof. M. Lelong at the Hôpital des Enfants Assistés, Paris. Case 2 was referred to us by Dr. J. Bousser and Dr. J. Tanzer, and was subsequently observed by Dr. P. Reuge (Vitry, Seine).

Centre de Recherches de l'Association Claude-Bernard, Service Jean Bernard, Hôpital Hérold, Paris 19e.

G. MATHÉ
TRAN BA LOC
P. SATGÉ.

JAUNDICE DURING TREATMENT OF MYELOMATOSIS WITH 4-4′-DIAMIDINODIPHENYLAMINE

SIR,—4-4′-diamidinodiphenylamine dihydrochloride (M. & B. 938) has recently been used for the first time in myelomatosis.[1 2] Of the first 10 patients treated, 1 had complete relief of bone pain, a fall in the erythrocyte-sedimentation rate, and recalcification of osteolytic lesions. He is still well five years after treatment. In a second patient, previous treatment with urethane had been without effect, but during treatment with 938 a palpable rib tumour disappeared and pain was relieved. A third patient had severe pain in the back despite previous radiotherapy to the area. The pain vanished during treatment with 938. In the other patients there was no obvious benefit.

It is worth noting that jaundice developed in 2 out of these 10 patients. It seems very probable that the jaundice in both these cases was due to the action of 938 upon the liver. The elevation of alkaline-phosphatase in the first case, and the histological picture of bile stasis without parenchymal damage, together with a negative thymol-turbidity test in the second case, suggest jaundice due to cholangiolitic obstruction rather than parenchymal liver damage.

It has been shown by Henry and Grindley [3] and Hampton [4] that the chemically related drug, stilbamidine, is highly cumulative. Although no definite information is available at the moment this may well be true of 938. Moreover, experience suggests that nothing is lost therapeutically by spreading treatment over many weeks.

We consider it is wise not to exceed a dose of 0·1 g. twice weekly or a total of 2·0 g. in any one course of treatment. Our current practice is to give 0·1 g. twice weekly for two weeks and thereafter once weekly.

Charing Cross Hospital, London, W.C.2.
The Royal Infirmary, Edinburgh.

A. M. DENMAN.
H. W. C. WARD.

TUBING MATERIALS

Dr. D. E. STEELE, assistant medical director of Portland Plastics Ltd., Hythe, Kent, writes:

I was interested to read of Dr. Indar's experience with indwelling polyethylene cannulæ in deep veins (Feb. 7). Polyethylene is not the most suitable material for this purpose, owing to its physical properties and difficulties in sterilisation; and experience has shown that, for intravenous techniques of this nature, cannulæ of flexible nylon, which can be safely autoclaved, are safer and more trouble-free.

Dr. Stewart and Mr. Sturridge in their paper last week on Hæmolysis caused by Tubing in Extracorporeal Circulation, do not mention the toxicity of the types of tubing used. In tubing made of polyvinyl chloride (P.V.C.) this is particularly important, as toxic tin stabilisers are frequently used in the production of clear P.V.C. tubing for other than medical purposes; such tubing is unsuitable for medical work. Tubing used for such apparatus as an extracorporeal circulation should be specially manufactured for the purpose, bearing in mind both its physical properties and the non-toxicity of its chemical constituents, and the tubing described by Dr. Stewart and Mr. Sturridge does not include more recent examples.

1. Ward, H. W. C. *Lancet*, 1958, i, 536.
2. Ward, H. W. C. *J. Fac. Radiol., Lond.* 1958, **9**, 221.
3. Henry, A. J., Grindley, D. N. *Ann. trop. Med.* 1942, **36**, 102.
4. Hampton, J. W. F. *ibid.* 1947, **41**, 226.

Public Health

Influenza

IN England and Wales, deaths from influenza, which numbered 54 in the week ended Jan. 31, increased to 144 in the week ended Feb. 7; of this total, 114 were of patients aged 55 or over.[1] The Ministry of Health states that localised outbreaks have been reported from many parts of the country, particularly the North, the Midlands, and the London area. In London at the beginning of this week the Emergency Bed Service still had in operation a "red warning", under which all but emergency admissions are halted; and, owing to depletion of staff, many London hospitals had Red Cross workers helping them. According to the Ministry, in some outbreaks strains of virus A (Asian) have been isolated; but in others virus B has been identified.

Measles

Notifications of measles in England and Wales in the week ended Feb. 7 amounted to 22,170, compared with 3,752 in the corresponding week last year.[1] In the five weeks ended Jan. 3, 10, 17, 24, and 31 the totals were: 18,179, 15,144, 12,675, 13,710, and 18,064. The aggregate total from the first complete week of this year up to Feb. 7 is 81,763, compared with 14,664 and 51,056 in the corresponding weeks of 1958 and 1957.

Tuberculosis Death-rates

A decrease of 50% or more in the death-rate from tuberculosis took place in many countries in 1952–57, according to a W.H.O. report.[2] Of the countries and territories covered by the report, the lowest rate is now found in Iceland, where it dropped from 13·5 per 100,000 population in 1952 to 4·3 in 1957; the rate in 1955 was only 2·5. The highest rate is in Hong Kong, where it dropped from 158·8 in 1952 to 102·6 in 1957. In the United Kingdom the rates per 100,000 in 1952 and 1957 were: England and Wales, 24·1 and 10·6; Scotland, 31·5 and 14·0; Northern Ireland, 29·8 and 12·5.

Notification of Acute Rheumatism

In 1947 rheumatic fever (including carditis of rheumatic origin) was made notifiable in patients under the age of 16 in Bristol, Grimsby, Lincoln, Sheffield, and the administrative county of Lindsey.[3] The 1947 regulations were supplanted in 1953, and the 1953 regulations have now been extended [4] to include notification in Lancashire, Cardiff, Manchester, and Newcastle-upon-Tyne.

1. Registrar-General's weekly return, 1959, no. 5. H.M. Stationery Office. Pp. 20. 1*s.* 6*d.*
2. *Epidem. vit. Stat. Rep.* 1958, 11, no. 10.
3. See *Lancet*, 1947, ii, 394.
4. Statutory Instruments 1959, no. 213: Acute Rheumatism (Amendment) Regulations, 1959. H.M. Stationery Office. 2*d.*

Parliament

Children's Hospitals

THE discussion on children's hospitals was continued in the House of Lords on Feb. 12 when Lord CROOK moved that it was essential to retain the existing large centralised children's hospitals because they were the most effective means of offering the children treatment and education and of training sick-children's nurses. This time the debate was thus couched in general terms, but Lord Crook readily admitted that it was again inspired by a particular case—the proposal to close Queen Mary's Hospital at Carshalton, probably the largest and best-equipped children's hospital in Britain.

In the ten-mile circle round the hospital, he said, there lived $2^3/_4$ million people, and patients also came from hundreds of miles away. It trained 15% of the nurses for the Special Register of Sick Children's Nurses. The regional board had concentrated all their special services for children there—including the self-contained cerebral-palsy unit. Forty teachers, some specially trained to teach handicapped children, gave lessons in the wards. Behind the suggestion to close this hospital, on which so much money and care had been spent, lay only one reason, Lord Crook declared—lack of capital to rebuild the Fountain Hospital for mentally deficient children at Tooting. This hospital had originally been erected as a temporary structure at the end of last century to cope with an epidemic of fever, and the buildings were now beyond repair. Since 1948 successive Ministers had promised to rebuild it, but no money had ever been forthcoming to do so. To provide accommodation for the Fountain Hospital at no apparent capital cost, the Minister now proposed to abolish Queen Mary's and spread its child patients around in thirty hospitals in the neighbourhood. To give them, thus scattered, even a semblance of the kind of treatment offered at Queen Mary's would, he submitted, involve an even larger capital expenditure than to rebuild the Fountain Hospital.

Lord Crook admitted that the Minister could justly point out that there were empty beds at Queen Mary's. The hospital had 550 beds with 150 in reserve; of these 400 were at present occupied. These children would be transferred to thirty-four different hospitals, of which three had children's units of 10 beds or less, fifteen had units of 11–20 beds, and twelve had units of 21–30. Yet 40 beds was the smallest unit generally approved by pædiatricians. The proposal to close Queen Mary's, he suggested, was based, not on policy, but on financial expediency, and a more sensible way of dealing with empty beds would be to move there the children from these other smaller units, thus releasing beds for adult use.

Lord AMULREE said that in the world at large the tendency was for children to be cared for in special children's hospitals. In this country, of the 11 principal medical schools outside London, 8 had special children's hospitals. It looked as if the practice in London was lagging behind the rest of the world.

Lord COHEN OF BIRKENHEAD drew a distinction between the needs of long-stay and short-stay child patients. Nearly 80% of the children at Queen Mary's stayed for less than a month, and these he thought could be dealt with satisfactorily in acute general hospitals with adequately equipped children's units. In deciding the future use of any hospital, and not only Queen Mary's, we must look for other uses, if the need for the specific use for which the hospital was built had lessened; but we must also ensure that, if patients were displaced, they were not deprived of any service.

Lord UVEDALE OF NORTH END had lately visited both the Fountain Hospital and Queen Mary's. He had found the Fountain overcrowded with 600 mentally defective children—50 children in a ward which should take only 25, and no day-rooms. There was a long waiting-list for admission. At Queen Mary's he found its well-spaced buildings standing in 100 acres. The total strength of the hospital was 550. The number of patients was 400. The educational facilities were exceptional. The equipment of the operating-theatres, and of the physiotherapy and other departments, was of the highest order. In his view, it would be a national loss to close the hospital. He, too, thought that the right answer to the problem was to fill Queen Mary's with children from other hospitals. For the Fountain Hospital he would like to see a new hospital built at Tooting. Whatever the cost, a start should be made to rehouse these patients.

Lord TAYLOR supported Lord Crook's plea for the concentration of sick children in large centralised children's hospitals. The only serious drawback was the inevitable increase in the distance for visiting by parents. He suspected that most of the short-stay patients at Queen Mary's could be looked after in children's blocks at their local hospital without serious detriment and with one benefit—they would be nearer their parents. The long-stay children were a more serious problem; and the poliomyelitis, muscular-dystrophy, cerebral-palsy, and rheumatic units at Queen Mary's had won a special name for the hospital. Whatever happened, he hoped that these units would not be dissipated.

The Earl of ONSLOW said that the suggestion about Queen Mary's was being considered by the Minister, but his decision had for the present been deferred. Lord CROOK in his reply saw no objection in principle to placing children in large well-organised blocks in other hospitals, but doubted whether these blocks in fact existed. The motion was withdrawn.

Youth Services

OWING to the war-time bulge in the birth-rate the number of school-leavers will rise abruptly during the next five years. There is disquiet about the increase in juvenile and adolescent crime, and in the House of Lords on Feb. 4 Lord PAKENHAM expressed his doubts whether we were doing enough to meet the needs of these young people. Young people today were better fed, better clothed, and better educated than their predecessors, but he thought that they were more vulnerable. In many ways they might be more promising; but if they did go wrong, they were more likely to go over the precipice. In his view those who left school at 15—and the vast majority did—were more neglected in their moral needs than any other section of the community. He welcomed the appointment last year of the Albermarle Committee to review our youth services, but he was discouraged by the scant support which the Government was at present offering for work among these young people. Statutory and voluntary youth services received from the local authorities and the Ministry of Education rather less than £3 million a year, which was half of 1% of the national expenditure on education.

Replying for the Government, the Earl of DUNDEE said that since the war successive Ministers of Education had been faced with shortages in the schools aggravated by the raising of the school-leaving age and by the large temporary increase in the birth-rate. There was still much to do in the schools, but we were now in a better position to contemplate an expansion of the youth services. Without waiting for the findings of the Albermarle Committee the Government were going to increase the grants to headquarters in England and Wales by £20,000 (20%). This was in the nature of a token increase to show that the Government were anxious to pay more attention to the youth services.

QUESTION TIME

Food Regulations and Tuberculosis

Mrs. SLATER asked the Minister of Health why he had not included tuberculosis in the Food Regulations which specify certain diseases which should exclude employment from food preparation.—Mr. REGINALD THOMPSON replied: There is no evidence that transmission of tuberculosis occurs through the handling of food. Mrs. SLATER: Is that not a dreadful reply, that it is possible for tuberculous people to be engaged in the preparation of food?—Mr. THOMPSON: Tuberculosis in this country is now largely a pulmonary infection acquired mostly

by close contact with persons suffering from pulmonary tuberculosis.

Dr. EDITH SUMMERSKILL: Is it not a fact that dry sputum is known to infect a person with whom it comes into contact?—Mr. THOMPSON: The Regulations are concerned with cases involving a risk of infection if the person concerned prepared or handled food or drink for human consumption, for instance, typhoid fever, paratyphoid fever or other salmonella infection, dysentery and staphylococcal infection likely to cause food-poisoning.

Teaching of Psychiatry

Mr. KENNETH ROBINSON asked the Minister if he would discuss with the General Medical Council the desirability of including either a compulsory paper or a compulsory question on psychiatry in the medical student's final examination.—Mr. WALKER-SMITH: This is not a matter on which I have any powers, but the suggestion will no doubt be noted by those concerned. Mr. ROBINSON: Will the Minister say whether there is any other way of ensuring that adequate attention is given to psychiatry in the medical student's curriculum? Does he not feel that for general practitioners of the future to be able to treat their patients properly and also to encourage students to undertake postgraduate courses in psychiatry it is essential that more attention should be paid to mental health in the teaching hospitals?—Mr. WALKER-SMITH: There are certain duties and powers resting with the General Medical Council in this context, but also for the past few years its policy has been designed to avoid giving detailed advice on the scope of instruction and the context of examinations because it has preferred to encourage flexibility and experimentation by the examining and licensing authorities.

Dr. SUMMERSKILL: In view of the fact that 45% of hospital beds are occupied by people with mental disorders, does the Minister not think it paradoxical that the medical student is not given an adequate education in psychiatry?—Mr. WALKER-SMITH: I do not think we must accept that they are not given adequate instruction in psychiatry. We know that they are given more instruction in psychiatry than was formerly the case and the younger practitioner has a larger equipment in this field than his senior used.

Mental Health Research

Mr. KENNETH ROBINSON asked the Minister, as representing the Lord President of the Council, when the Medical Research Council last appointed a mental health committee.—Mr. WALKER-SMITH replied: The Medical Research Council had a mental disorders subcommittee during the 1930s, which lapsed with the war. In 1955 the Council's clinical research board set up a mental disorders subcommittee which reported during that year. The Council is at present making a full-scale review of mental health research and the question of appointing one or more expert advisory committees is under consideration.

Nurses' Working Hours

The working hours of the nursing staff have been reduced to 88 hours per fortnight, in full or substantially, in 69% of general hospital groups in England and Wales, partially in 21%, and not at all, or only negligibly in 10%. The percentages for the mental-hospital groups are 54%, 14%, and 32% respectively. To enable hospital authorities to make further progress towards introducing the 88-hour working fortnight the Minister of Health will, for the next financial year, make available additional funds to regional hospital boards, with higher shares for those in whose regions the existing staffing ratios are relatively low. This is in order to help particularly those hospital management committees which cannot significantly reduce hours without increasing staffs.

Merit Awards

The number of awards made in England and Wales at the end of 1958 was 2429 and the total cost was about £1,986,000. 279 were A awards, 698 were B awards, and 1397 were C awards.

Obituary

JOHN TAYLOR

Kt, C.I.E., D.S.O., M.D., LL.D. Glasg.

Major-General Sir John Taylor, who died on Feb. 7 at the age of 74, was a former director of the Central Research Institute at Kasauli. In this key position he proved himself a good administrator and a persuasive spokesman. He knew every detail of the work being done in the institute, and he was successful in obtaining funds for research. He was also a sound bacteriologist and his name in India will always be associated with his epidemiological studies of cholera.

He qualified from the University of Glasgow in 1905 and he entered the Indian Medical Service the following year. In 1908 he was transferred to the Haffkine Institute in Bombay and he was a member of the Indian Plague Commission which, under the leadership of Charles Martin, discovered that bubonic plague was transmitted by the rat flea. During these years he travelled a great deal through remote districts, often on horseback. He was largely concerned with the preparation of an effective plague vaccine, and this remained one of his interests.

During the 1914-18 war he temporarily gave up his laboratory work, and he was awarded the D.S.O. for gallantry in the field. He ended his war service as Baghdad's first medical officer of health during its occupation by British troops.

When he returned to his civilian duties he spent two years as public-health commissioner with the Government of Assam before he joined the staff of the Pasteur Institute at Rangoon. Soon afterwards he was appointed director of the institute. It was in Burma that he began his work on cholera, rabies, leptospirosis, and beriberi. In 1932 he was for a short time director of the Haffkine Institute before he succeeded Sir Rickard Christophers as director of the Central Research Institute at Kasauli. He held this post for twelve years of development and difficulty. The Pasteur Institute was absorbed and suitably housed and the war-time need for T.A.B. vaccine was successfully met by a restricted staff under his very direct direction. He was also a member of the Army Pathology Advisory Committee in India.

As editor of the *Indian Journal of Medical Research* and as adviser in research to the Government of India, he was well informed about all the investigations which were being carried out in the whole subcontinent, and his influence on the shape of research was considerable. A biological standards laboratory had been set up at Kasauli, and his help was naturally sought when the legislation governing the manufacture and sale of biological products was being drafted. For his varied work at Kasauli he was created C.I.E. in 1937 and knighted in 1942.

After his retirement in 1944 he returned to this country, extremely active and still anxious for work. He served most efficiently for a further span in dual appointments with the Colonial Medical Research Committee and the Medical Research Council. In this work, and in his services to the Royal Society of Tropical Medicine and Hygiene, his long experience of editorial duties, tropical diseases and research, and judgment of character proved an invaluable combination.

Of the man, apart from the administrator and scientist, one of his colleagues writes:

"Taylor enjoyed life, particularly sport, and he confessed to having spent a lot of money on his horses and on racing, but added that he did not regret a penny of it. He was an enthusiastic fisherman and an authority on flies, which he made himself. In person he was slight and even thin, and his features were long and angular. He had rather a quiet, unaggressive voice; but people listened when he spoke, for there was a quality of effectiveness about him and an air of

competent seriousness in his talk on his own subject. This could be translated into most effective writing.

"He was a notable figure, tough and unbeatable, but companionable; he liked adventure and he got it, and if he was not a scientific pioneer, he was the next best thing—a man not content with anything but proof."

Another friend recalls a small incident which shows yet another side of his personality:

"Taylor, devoted as he was to his laboratory, was essentially an outdoor man; he was a fine rider, an excellent shot, and had a great reputation as a flyfisher. There was something more; he could feel the wonderment of mountains and snow. I remember well the pleasurable companionship on one occasion at least of that curious emotion that comes up with some intensity under this influence. It was just an ordinary walk when we paused to look back to the distant Himalayas completely covered in snow. It was wonderfully clear in the bright sunlight. Long we gazed in silence much moved, unable to look away. Finally we turned and continued our walk but hardly spoke until we were nearly home."

His wife died in 1954 and his only son was killed in Normandy in 1944. He is survived by twin daughters.

JOSEPH BASIL COOK

M.D. Vict., D.P.H.

Dr. J. B. Cook, who for over thirty years was medical director of the West Middlesex Hospital, Isleworth, died at his home at Richmond on Feb. 8 at the age of 81.

He was the son of a North London doctor who came from a long line of Berkshire farmers of Uffington in the Vale of the White Horse. He was educated at Christ's Hospital, Owens College, Manchester, and St. Bartholomew's Hospital. After qualifying in 1902 he held house appointments in hospitals at Brighton and Oldham before he became an assistant medical officer at Kensington Infirmary. Later he was medical superintendent of St. Giles Infirmary, and in 1913 he was appointed medical superintendent of the West Middlesex Hospital at Isleworth. During the 1914–18 war he left the hospital to serve for two years as a major with a casualty-clearing station. He was a past president of the Hunterian Society.

A colleague writes:

"When Basil Cook went to West Middlesex he had two assistant medical officers, a fairly modern guardians' hospital, and some 300 patients. Under his guidance, with later the assistance of Middlesex County Council, the hospital expanded to over 1100 beds—mainly acute. He was the king pin in this enterprise, and he often spoke of his early difficulties and the tact and restraint he forced on himself in a period of innumerable committee meetings. He discovered that he had to learn many of the arts of the building trade, and he was much troubled by architects who, as he used to explain, always believed that each and every one of them was the heaven-sent designer of hospitals, never having had to work in one. On holidays he visited many Continental hospitals, to get ideas for the steady expansion of West Middlesex which took place in the 'twenties and early 'thirties. By 1935 the main hospital had doubled in size, and a few years later the medical responsibility for the adjacent old infirmary, with some 700 beds, was added; and these beds too were slowly upgraded.

"In his later years he had a benevolent appearance, much like that of Mr. Pickwick. He had none of the flamboyance of the super-administrator; and, as he once confided, he had to steel himself to be stern with a delinquent. In his rare off-duty times he rambled round the country in his car to study village churches of Southern England, of which he had a remarkable and often surprising knowledge. After his retirement to Richmond in 1946 he pottered in his garden. In his last illness, he returned as a patient to the West Middlesex."

He leaves a wife, who has long been a Middlesex magistrate, and an only daughter.

Notes and News

THE HUNTERIAN FESTIVAL

LAST Monday the Royal College of Surgeons of England celebrated the anniversary of John Hunter's birth. This was one of the full Hunterian festivals, held every second year. The Hunterian oration was given by Sir Reginald Watson-Jones, whose title was Surgery is Destined to the Practice of Medicine. At dinner in the evening Sir James Paterson Ross presided over a large company which included the French Ambassador, the High Commissioner for South Africa, the Lord Chancellor, and four other Ministers of the Crown.

Proposing The College, Sir DAVID ECCLES, President of the Board of Trade, recalled that his father, McAdam Eccles, who won the Jacksonian prize in 1900, served on the council for some 24 years. "No child," he remarked, "could have better fortune than to be brought up in a household where the standards of the medical profession are faithfully observed." Sir JAMES PATERSON ROSS, responding as president, spoke of the college as a powerful link between England and the Commonwealth. He mentioned that Sir Zachary Cope has been writing its history, and he had a special word of thanks for the valiant and successful efforts of Sir Hugh Lett on behalf of the Hunterian museum. After saying that the college depends more and more on the work of the technical and the administrative staff, Sir James referred to some recent tributes to holders of the research chairs. In the task of raising the funds needed for education and research, the fellows had given solid backing by their contributions; but the college, as one of the few remaining voluntary institutions in medicine, deserved support from all men of good will. From the chairman of its appeal committee, Lord Kindersley, it had had inspiring leadership, and it was deeply indebted to such benefactors as Mr. Edward Lumley (after whom the great hall is to be named), Mr. G. A. Vandervell (who has endowed the chair of pharmacology), and especially Sir Simon Marks.

After the Bishop of LONDON had responded for The Guests, given by Mr. A. DICKSON WRIGHT (vice-president), the toast of The Hunterian Orator was proposed by Sir ARCHIBALD MCINDOE (vice-president). Traditionally, he said, the orator's task was to speak as John Hunter would "were he by some miracle to appear before us". This Sir Reginald Watson-Jones had done, and his oration would be long remembered.

CARE OF THE AGED

THE National Corporation for the Care of Old People [1] has lately been putting more of its effort into research. Evaluation of existing services with a view to their improvement is easier for the research-worker than for somebody who is actually engaged in running these services.

The corporation is nearing the end of a 3-year study of chiropody. It would like old people to have a less restricted chiropody service than they get under the National Health Service, and it will soon be issuing a report.

A national inquiry into the mobile meals service is being made. Random samples of old people who receive these meals and of those who do not are being interviewed.

The costs of domiciliary and institutional care of the aged are being compared, and the usefulness of workshops for old people is being studied.

Research into the design, siting, building, and cost of houses is to be undertaken.

A start has been made with compiling an index of research, which will provide information about surveys and inquiries into the social and sociomedical aspects of old age. This will, it is hoped, supplement the work of the National Old People's Welfare Council.

A report will be published on the Exeter and Plymouth schemes for boarding out old people in private houses.

The corporation points out that the present services for old people will have to be extended and improved. For proper integration of these services there must be cooperation between all who are taking part; and if the various organisations are to cooperate they must know what the others are doing. All workers should not only understand what is required of them as individuals, but also see the whole national picture and how they fit into it.

1. Eleventh annual report of the corporation. (Nuffield Lodge, Regent's Park, London, N.W.1.)

WELFARE OF CHILDREN IN HOSPITAL

HOSPITAL authorities have been notified [1] that the Minister of Health agrees with the recommendations of a committee of the Central Health Services Council which has considered arrangements in hospitals for the welfare of ill children,[2] and the Ministry has invited hospital authorities to implement these recommendations. In particular, these authorities are asked to give attention to the recommendations that, where children are scattered through adult wards, they should be gathered into a children's unit available to any member of the medical staff, and that adolescents should be grouped separately or with children. In a few hospitals, says the Ministry, the layout of existing buildings may prevent this; but in many rearrangement may be possible, at least as regards young children. The Ministry once again draws attention to the importance of frequent visiting of children in hospital; and it asks hospital authorities to consider the recommendation that " unrestricted visiting " should be introduced for parents; this recommendation applies, with safeguards, to infectious-disease hospitals. The Ministry hopes that hospitals will find it possible, in suitable cases, to admit mothers with their children. Finally, hospital authorities are asked to report in a year on the action they have taken to implement the recommendations in the report.

AN INTERNATIONAL STUDENTS' JOURNAL

THE first British edition of *Intermedica*, the journal of the International Federation of Medical Students' Associations, carries messages of welcome from past presidents of the association and from Sir Cecil Wakeley, a past honorary president. Mr. Graham Lister, the president, describes the Association's working programme for 1958–59. The journal is to be published at least twice a year, and it is hoped that the next issue will be published in English, French, and German. The editor may be addressed at the offices of the British Medical Students' Association, B.M.A. House, Tavistock Square, London, W.C.1.

University of Cambridge

On Feb. 7 the following degrees were conferred:

M.B., B.Chir. (by proxy).—D. P. S. Heath, M. I. Lander.
M.B.—J. R. Bartlett, D. J. Richards, J. D. M. Stewart, R. P. Wilding, R. B. Woodd-Walker.

The Wellcome Trust have made a grant of £120,000 towards the cost of adding a new wing to the department of biochemistry.

Sir Russell Brain will deliver an Arthur Stanley Eddington lecture at the Arts School on Tuesday, Feb. 24, at 5 P.M. The title of his lecture will be Science, Philosophy, and Religion.

University of Aberdeen

Dr. A. G. Macgregor, senior lecturer in therapeutics in the University of Edinburgh, has been appointed regius professor of materia medica in the University of Aberdeen in succession to Sir David Campbell, who retires in September.

Dr. Macgregor, who is aged 39, received his early education at Glasgow and at Hartford, Connecticut, U.S.A., before going to Fettes College, Edinburgh. Thereafter he returned to Glasgow where he graduated B.SC. in 1940 and qualified M.B. in 1943. He served in the Royal Naval Volunteer Reserve from 1944 to 1946. In 1948 he went to Sheffield University as research assistant and later lecturer in the department of pharmacology and therapeutics, where he remained until 1952 when he took up his present post. He became F.R.F.P.S. in 1947 and M.R.C.P. in 1948. In 1952 he graduated M.D. with high commendation. Two years later he became M.R.C.P.E., and he was elected to the fellowship in 1957. Dr. Macgregor has published reports on, among other things, metabolic disorders and the use of radioactive iodine in the assessment and treatment of thyroid disease.

International Congress for Internal Medicine

This congress is to be held in Basle on Aug. 24-27, 1960. Further particulars may be had from the secretariat of the congress, 13, Steinentorstrasse, Basle, Switzerland.

1. H.M. (59) 19.
2. See *Lancet*, Feb. 14, 1959 p. 352.

Royal College of Surgeons of England

At a meeting of the council on Feb. 12, with Sir James Paterson Ross, the president, in the chair, Mr. G. H. Macnab and Prof. C. G. Rob were elected, and Mr. E. C. B. Butler and Mr. S. H. Wass were re-elected, to the court of examiners. The Hallett prize was awarded to Dr. G. R. Duncan (Otago) and Dr. H. L. Eaton (Ceylon).

A diploma of fellowship was granted to A. O. Wilkey, and diplomas of fellowship in the Faculty of Anæsthetists to the following:

J. A. Blundell, H. N. Chambers, Sylvia I. Duckworth, K. G. Lupprian, A. R. Bollen, Dorothy A. Wescott, A. F. M. Little, M. D. A. Vickers, J. R. S. Hutchison, G. D. Allen, M. W. Glossop, S. M. Laird, J. T. Davidson, I. B. Denny, Nerida M. Dilworth, A. S. Manavalan, Vivian Stanhill, Vaithianathar Selvaduray Padmanathan, Margaret E. Riddoch, S. S. Barker, Donald Campbell, D. W. Eyre-Walker, Annie Mortell, G. M. J. White, Thomas Forrest, Alan Gilston, P. J. Healy, D. M. McWilliams, J. S. Miller, J. S. Robinson, R. B. Roe, R. J. Sweeney, P. J. Verrill, Joan M. Byrne, Henrietta P. A. G. McNeil, M. W. Potts, S. A. Feldman.

Licences to practise and the diplomas mentioned in our issue of Feb. 7 (p. 321) were conferred jointly with the Royal College of Physicians. In addition licences to practise were conferred on the following:

P. M. J. Bennett, D. D. Craig, John Farmer, R. B. Huddy, C. J. M. Maxwell.

Prof. A. A. McConnell (Dublin), Mr. E. D. Ahern (Brisbane), Dr. J. H. Gibbon (Philadelphia), Dr. P. R. Hawley (Chicago), Dr. Richard Lewisohn (New York), and Dame Lillian Penson (London) have been elected to the honorary fellowship of the college.

Royal College of Physicians of Ireland

At a meeting on Feb. 6, with Dr. P. T. O'Farrell, the president, in the chair, the following were admitted to the licence and membership:

H. A. Lyons, Patrick Mangan, M. D. Mulcahy, D. R. O'Holohan.

Dr. R. H. Micks was elected King's professor of materia medica and pharmacy.

College of General Practitioners

Members or associates of the college are invited to submit essays, entitled The Child is Father of the Man, for the Butterworth gold medal. Further particulars may be had from the chairman of the awards committee of the college, 41, Cadogan Gardens, Sloane Square, London, S.W.3. Essays must be submitted by Sept. 19.

Travel Grant for General Practitioner

The English-Speaking Union invites applications for doctors in general practice (preferably in the 30s but not over 50) for a Ford Foundation/English-Speaking Union travel grant to visit the United States for 56 days during 1959–60.

The closing date for applications is May 25, and further details may be had from the secretary of the English-Speaking Union, Dartmouth House, 37, Charles Street, London, W.1.

Hunterian Society

At the annual dinner, held in London on Feb. 12, the toast of The Society was proposed by the Marquess of Exeter, who spoke of John Hunter as a man with immense ability, intellect, and curiosity. Turning to the present day, he suggested that the general practitioner should be able to go into the hospital, where he could help his patients by removing their fears and encouraging them. In his reply, Dr. Francis Leslie, the president, paid a tribute to the work of the two hon. secretaries—Dr. C. W. Kesson and Mr. George Qvist. Dr. C. F. White, proposing The Lord Mayor and Corporation of the City, remarked that the City's tradition gave a sense of permanence and continuity; the present Lord Mayor was the 631st. Sir Harold Gillett, the Lord Mayor, recalled that in the 1939-45 war 27¾ million square feet of floor space in the City had been destroyed; up to the end of 1957, 13 million square feet had been restored. Lord Adrian responded on behalf of The Guests to a toast proposed by Dr. G. B. Mitchell-Heggs.

The Nuffield Provincial Hospitals Trust has made a grant of £12,000 to Cheadle Royal Hospital for the setting up of an experimental day hospital for 40–60 patients.

An Eli Lilly medical research fellowship ($3600 per annum) is open to South African doctors who wish to do research in the United States. Further details may be had from Dr. H. Shapiro, P.O. Box 1010, Johannesburg. The closing date for applications is June 30.

Prof. J. H. F. Brotherston has been appointed chairman of the committee on the welfare of the disabled of the Scottish Council of Social Service.

A course in dermatology for general practitioners is to be held in Sheffield on April 13–17. Details will be found in our advertisement columns.

At a meeting of the Alfred Adler Medical Society at 1, Wimpole Street, London, W.1, on Thursday, March 5, at 8.15 P.M., Dr. Spencer Paterson will speak on physical methods in psychotherapy.

At a meeting of the Christian Medical Fellowship to be held at the Royal Commonwealth Society, Northumberland Avenue, London, W.C.2, on Wednesday, March 11, at 8.15 P.M., Dr. D. M. Lloyd-Jones will speak on The Battle for the Mind.

At a meeting for general practitioners to be held at University College Hospital, Gower Street, London, W.C.1, on Sunday, March 1, at 10.15 A.M., Dr. C. J. Hodson will give a clinical demonstration on recent advances in radiology.

The staff of the professorial unit of the Institute of Laryngology and Otology will give demonstrations of tests of acoustic and vestibular function at the institute, 330, Gray's Inn Road, London, W.C.1, at 5.30 P.M. from Tuesday to Friday, Feb. 24 to 27.

The organisers of the London Medical Exhibition will hold their annual regional exhibition this year at the City Hall, Manchester. The exhibition is to be opened by Sir Geoffrey Jefferson at 2.45 P.M. on Monday, April 27, and will remain open till May 1.

The 16th edition of the *Register of Orthoptists* has been published by the Board of Registration of Medical Auxiliaries. Copies are supplied free to doctors (others 5*s*. post-free) on application to the registrar of the Board, B.M.A. House, London, W.C.1.

'Styrene' polystyrene latex, referred to by correspondents (*Lancet*, 1958, ii, 1286, 1374), is to be distributed by B.D.H. Ltd., Laboratory Chemical Division, Poole, Dorset, which is prepared to provide samples for evaluation.

CORRIGENDUM: In the article *Health and Social Class* (Feb. 7) the total for the last column of the table on p. 305 is 339 (not 399).

Appointments

BARRITT, D. W., M.D. Lond., M.R.C.P.: assistant cardiological physician, United Bristol Hospitals.
CARMICHAEL, J. H. E., M.D. Lpool, D.M.R.D.: part-time consultant radiologist, Broadgreen and Newsham General Hospitals, Liverpool.
EVERARD, G. J. H., M.B. St. And., D.M.R.D.: radiologist (S.H.M.O.), Aberdeen general and special hospitals.
FORSYTH, ROSEMARY M. J., L.R.C.P.E.: school M.O. and assistant M.O.H., Derby.
GILMOUR, I. E. W., M.B. Edin., F.R.C.S.E.: consultant surgeon, Deaconess Hospital, Edinburgh.
HALL, W. S., L.R.C.P.E., D.A.: anæsthetist (S.H.M.O.), based on Kirkcaldy General Hospital.
MCKENDRICK, THOMAS, M.B. Lond., M.R.C.P., D.C.H., D.P.H.: medical registrar and pathologist, The Hospital for Sick Children, Great Ormond Street, London.
MORRISON, I. M., M.B. Aberd., F.R.C.S.: part-time consultant assistant thoracic surgeon, regional thoracic surgery service, Liverpool.
PARTRIDGE, J. P., M.B. Lond., F.R.C.S.: surgical outpatient assistant, The Hospital for Sick Children, Great Ormond Street, London.

Colonial Appointments:

AMIES, D. R., M.B. Lond.: M.O., Northern Region of Nigeria.
CLARK, R. V., M.B. St. And.: M.O., Northern Region of Nigeria.
HEELAN, F. D., M.B. N.U.I.: M.O., Sierra Leone.
HEYLEN, V. F., M.B.: M.O., Sierra Leone.
HOPWOOD, B. E. C., M.R.C.S., D.P.H., D.I.H.: specialist (industrial medicine), Uganda.
HORN, D. W., M.B. Edin., D.P.H., D.T.M. & H.: senior specialist (medical statistician), Nigeria.
HUNTER, G. W. G., M.B. Aberd.: M.O., Aden.
LANDER, M. I., M.B. Cantab.: M.O., Northern Region of Nigeria.
MAJUMDER, M. N. G., M.B., D.P.H., D.I.H., D.T.M. & H.: M.O., Sarawak.
MASTER, ROSHAN F., M.B. East Punjab: M.O., Tristan da Cunha.
NICOL, B. M., O.B.E., M.B. Aberd.: senior specialist (nutritionist), Nigeria.
NORMAN-WILLIAMS, C. M., M.B. Edin., D.T.M. & H., D.P.H.: chief medical adviser, Nigeria.
PARROTT, DAVID, M.B. Lond.: M.O., Northern Region of Nigeria.
PENDLETON, D. L., M.D.: M.O., Northern Region of Nigeria.
STONE, K. M., L.M.S.S.A.: M.O., Uganda.
SELL, D. N., L.A.H. Dubl.: M.O., Tanganyika.

Diary of the Week

FEB. 22 TO 28

Monday, 23rd

UNIVERSITY COLLEGE, Gower Street, W.C.1
5 P.M. Prof. Alexander Haddow: The Chemistry and Biology of Cancer. (Last of three lectures.)
POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12
4 P.M. Dr. R. M. Marquis: Heart Disease in Pregnancy.
HUNTERIAN SOCIETY
8.30 P.M. (Mansion House, E.C.4.) Sir Arthur Porritt: John Hunter's Women.
MANCHESTER MEDICAL SOCIETY
9 P.M. (Medical School, University of Manchester.) *General Practice.* Dr. R. G. W. Ollerenshaw: Medical Illustration—the Development of a New Service.
UNIVERSITY OF ST. ANDREWS
4 P.M. (Department of Medicine, Dundee.) Prof. R. B. Hunter: Virilising Syndromes—Problems of Intersex.

Tuesday, 24th

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
5 P.M. Dr. R. A. Goodbody: Repair. (Erasmus Wilson demonstration.)
BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Dr. T. A. J. Prankerd: Viability and Survival of Red Cells.
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Medicine.* Dr. Lindsey Batten, Dr. E. R. Cullinan, Mr. A. Dickson Wright: The Medical Acute Abdomen.
ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Mr. George Pinker: Pudendal Nerve Block for Obstetrical Anæsthesia.
ROYAL ARMY MEDICAL COLLEGE, Millbank, S.W.1
5 P.M. Brigadier R. E. Tunbridge: Diagnostic Problems in Disorders of the Biliary Tract.
INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. R. G. Cochrane: Leprosy. (Second of two lectures.)
ROYAL STATISTICAL SOCIETY
5.30 P.M. (London School of Hygiene and Tropical Medicine.) *Medical Section.* Mr. J. Wrigley: Development of National Health Service Statistics.
MANCHESTER MEDICAL SOCIETY
4.30 P.M. (Medical School, University of Manchester.) Dr. K. D. Keele: Leonardo da Vinci as Biologist.
UNIVERSITY OF ST. ANDREWS
5 P.M. (Physiology Department, Dundee.) Dr. R. F. Mahler: Use of Radioactive Carbon Compounds in Quantitative Biochemistry.

Wednesday, 25th

ROYAL SOCIETY OF MEDICINE
5 P.M. *Endocrinology.* Dr. W. Klyne, Dr. J. C. Eaton, Dr. T. M. Chalmers, Dr. G. I. M. Swyer, Dr. Margaret C. N. Jackson, Mr. J. A. Chalmers: The Chemical, Pharmacological, and Clinical Aspects of the 19-nor-Steroids.
POSTGRADUATE MEDICAL SCHOOL
2 P.M. Prof. R. A. Willis: Transplantation of Embryonic Tissues to Adults.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. J. O. Oliver: Blood and Bone Marrow Changes in Reticulosis.
INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Dr. N. C. Oswald: Pneumonia.
BRITISH PSYCHOLOGICAL SOCIETY
8.30 P.M. (11, Chandos Street, W.1.) *Medical Section.* Dr. I. C. Kaufman (Boston): Psychological Factors in the Ætiology of Epilepsy.
UNIVERSITY OF OXFORD
5 P.M. (Radcliffe Infirmary.) Prof. L. N. Pyrah: Aspects of Renal Calculus Formation. (Litchfield lecture.)
UNIVERSITY OF ST. ANDREWS
4 P.M. (Department of Medicine, Dundee.) Dr. J. M. Stowers: Investigation of Hypoglycæmic Agents.

Thursday, 26th

ROYAL COLLEGE OF SURGEONS OF ENGLAND
5 P.M. Mr. Cyril Havard: Non-malignant Bile Duct Obstruction. (Hunterian lecture.)
ROYAL SOCIETY OF MEDICINE
8 P.M. *Urology.* Prof. M. L. Rosenheim, Dr. C. J. Hodson: Pyelonephritis.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. D. I. Williams: Non-tuberculous Granulomas.
LIVERPOOL MEDICAL INSTITUTION, 114, Mount Pleasant, Liverpool, 3
8 P.M. Dr. Nicholas Bennett Jones, Dr. George Ansell: Cortisone.

Friday, 27th

ROYAL SOCIETY OF MEDICINE
5 P.M. *Pædiatrics.* Dr. A. Doyne Bell, Mr. E. Blishen, Mr. H. A. T. Child, Dr. R. F. Barbour: The Child Who Could do Better at School.
8.15 P.M. *Obstetrics and Gynæcology.* Prof. W. C. W. Nixon, Mr. Arnold Walker, Mr. Norman Kimbell, Prof. Chassar Moir: Uses and Abuses of Ergometrine.
POSTGRADUATE MEDICAL SCHOOL
4 P.M. Prof. G. A. Smart: Auto-immune Reactions in Thyroid Disease.

Births, Marriages, and Deaths

DEATHS

STEELE.—On Feb. 9, suddenly, Russell Vyvyan Steele, M.B., K. St. J., late area commissioner, St. John Ambulance Brigade, London, N.W.1.

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